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New Buying Less Active

Mill Shipments the Largest Since October

Canadian Railroads Will Buy in This Country— Pig Iron Markets Quieter

Our reports from the leading iron and steel centers this week refer to some falling off in new orders for finished materials, though mill operations are now on a larger scale than in any month since October.

In the case of the United States Steel Corporation, while no figures are given for the new bookings since March 1, it is understood that the average in most products is up to that of February, while counting the expected rail tonnage from the Harriman roads, which would offset in large part the Pennsylvania and New York Central contracts in February, the average of the latter month would be equaled.

The steel industry's contribution to the improvement in our export trade for February was more than is generally appreciated. Something is to be said, also, of the bearing upon general business conditions of an excess of \$418,000,000 in our total exports over imports in the eight months ending with February. Yet the disposition is shown everywhere to go forward cautiously and to await the clearing up of what is unsettled.

It is evident that Canadian railroads must place some good-sized rail orders with American or British mills, if they are to get deliveries this year. The Canadian Pacific is now inquiring for 25,000 tons in this country. The Canadian Northern is reported to have bought 90,000 tons, but will need a further amount which Canadian mills cannot supply. The Queensland Government has entered the market for 25,000 tons of rails and New Zealand for 8000 tons.

Domestic rail orders this week include 5000 tons for the Chicago & Northwestern, in addition to the recent contract for 40,000 tons, and 3000 tons for the Ocala Northern in Florida.

Structural steel work is a little more active, but the number of very low priced fabricating contracts is still a disturbing factor, since it is evident that in some of these cases mill prices are also dragged down. For the New York Post-Office at the Pennsylvania Terminal, 6400 tons of steel is about to be awarded, and 3700 tons for the Masonic Temple in New York. The Jones & Laughlin Steel Company has the steel contract for the new prison at Wingdale, N. Y., about 3500 tons. Two railroads placed bridge orders last week amounting to 2700 tons, but railroad buying in general is not robust.

Plate manufacturers will confer this week over conditions in that trade, but there are no other conferences, as reported, apart from regular meetings of presidents and sales managers of Steel Corporation subsidiaries. The contract for 6000 to 7000 tons of hull plates for the new battleship to be built at the

Brooklyn Navy Yard will be awarded at once. Worth Brothers were low bidders.

A Canadian mill has bought a further 5000 tons of billets in the Chicago district, paying \$1 advance over the basis for 25,000 tons placed in January and February.

In pig iron sentiment has been helped by the statistical reports of March 1. Eastern Pennsylvania and Virginia furnaces together showed a gain of 50,000 tons in unfilled orders in February; and a net decrease of less than 2000 tons in stocks. Alabama stocks were reduced. In the Central West stocks showed a small decrease, the first in many months. The volume of foundry iron sales is small, but furnaces are getting advances of 50c. over the low basis of February, particularly for deliveries past the middle of the year. At Buffalo a sale of 10,000 tons of basic and malleable iron is reported, with 25,000 to 30,000 tons for implement works either closed or under negotiation.

Two lots of basic iron, 5000 tons each, were sold in eastern Pennsylvania at \$15.25 for second and third quarter delivery. In the Pittsburgh district there is a decided lull in steel making iron.

No important reservations of Lake Superior ores have been made beyond those noted a few weeks ago, and reports of the establishment of last year's prices are untrue.

The coke market shows more life, and makers are standing out for better prices. An Eastern furnace interest is in the market for 10,000 tons a month for the remainder of the year. A Valley buyer has paid \$1.60 for 8000 to 10,000 tons a month up to July 1, and \$1.80 for a like amount through the second half.

Efficiency and Its Broader Application

The voluminous discussion of greater efficiency as the thing most needful in our industries to-day has dealt with it almost entirely as applied to production. The analysis of manual and machine operations, with a view to the elimination of superfluous motions by the workman and for the use of the machine in the most effective way, has been put forward as a chief feature of the new campaign. Much has been said, also, concerning functional foremanship as an essential to intensive production. The tendency has been to concentrate expert study upon the problems of the operating department, particularly on the devising of means of increasing the output of men and machines, with larger earnings to the workman for his co-operation in the plan.

It is pointed out in the article on another page, discussing "Business Administration as a Constructive Science," that emphasis has been thus put upon the manufacturing department as the field of administrative effort, almost to the ignoring of the other highly important co-ordinate branches of industrial organization, as selling, purchasing and financing. Management has been so often interpreted as the managing of men employed in the manufacturing processes, that its far broader scope has been missed. Administration as the science of all the forms of power employed in business is found to be vastly more than finding ways of speeding up the human machine and every other form of power employed in turning out product.

Practical examples of the mistake of putting operating experience in the saddle will come readily to mind.

The economies strained after in the production department are often minute. In steel manufacture they are frequently measured in cents per ton of product. Yet mistakes in cost finding, in the price at which product is sold, in the price paid for materials, or in credit improperly extended, may often neutralize all that the best equipped manufacturing department has accomplished in lowering the unit of production cost. President Farrell, of the United States Steel Corporation, said in his paper at the New York meeting of the American Iron and Steel Institute last year:

Without any desire to belittle the practical value and importance of effecting a saving in cost of production, however small, it has always seemed particularly hard upon the men who have accomplished what may appear as an insignificant reduction of the previous month's costs of producing pig iron or ingots or wire rods, to have this saving in mill costs dissipated by the sales department "quietly meeting the market" with a reduction of \$1 or \$2 per ton at the first sign of any cloud on the commercial horizon. Good salesmanship and sound business principles in the conduct of the selling of iron and steel are just as essential and vital to the prosperity and continued success of the industry as low costs and up-to-date machinery and manufacturing practice.

While Mr. Farrell's argument was intended to bear directly on the policy of co-operation in the selling departments of the large steel companies, it illustrates well how far the study of operating problems falls short of meeting the demands of successful business administration. It is probably true, so far as the steel industry is concerned, that what is commonly thought of as its engineering side—the field of economical production—has been more highly developed in the past 20 years than any other department. With all the boasted economies in administration, due to consolidation in the steel trade, it is a question if the selling side of the United States Steel Corporation, for example, with its duplication of organizations along product lines, does not offer opportunities for savings that have been missed in the strain to shade mill cost sheet figures.

What is here said of the steel industry is merely illustrative; in other form it may be applied to other industries. So much has been made of the wage issue in recent years that it is not surprising that the outlay for work done in the manufacture of product has been a special challenge to efficiency engineers. Works management and production systems, moreover, were lines of least resistance; the study to improve them did not involve the status of individuals "higher up." Naturally the advance of the efficiency engineer upon the broader problems of administration, in which the organization of a business as a whole comes under review, will be much more difficult.

Trade Co-operation and Government Oversight

There was no novelty in the proposal made by George W. Perkins of New York in an address before the Southern Commercial Congress at Atlanta last week for Government regulation of corporations. But the speaker offered one suggestion which has arrested attention, in proposing a Federal court for business questions, especially the supervision of corporations—a court in which no man could sit who had not had a business training with an honorable record. It is a sign of the times that whereas only a few years ago Government oversight of business was resisted by the leaders in industry and finance, so many men in control of large affairs are now acquiescing in the

proposal or actively advocating it. But with or without the consent of large interests, Government regulation is at hand, and its scope may prove to be greater than the business interests of the country have commonly entertained in their thinking. It may be questioned, indeed, whether those who have so warmly advocated co-operation among manufacturers making like products have given full consideration to some of the things to which co-operation is likely to lead. In his Atlanta address Mr. Perkins said:

As surely as you cannot have competition unless it competes, just as surely you can only have co-operation that co-operates. I mean by this, co-operation in any given line of business will fail unless it is co-operation between labor and capital, between capital and consumer, between company and Government. Co-operation between labor and capital cannot be effected by the mere paying of wages and by the giving of gratuities or voluntary rewards at the end of the year. . . . The question between capital and labor to-day is not so much the amount of wage a man should be paid as it is whether that wage is a fair proportion of the earnings of the business.

The closer the world is drawn together and the better people know each other, the better they understand each other and the more impossible it is to adopt and pursue secretive methods—to obtain for any one branch of a business unfair and improper profits; and one of the things that intercommunication has done has been to sound the death knell of secretive methods.

The Government interpretation of the passing of secretiveness in business has been seen in the investigations carried on in the past few years by the Bureau of Corporations. So far as the United States Steel Corporation is concerned, taking it as a conspicuous example, it is probable that the records at Washington contain every material fact as to its costs, its methods and its properties. The idea of the present executive at Washington is well indicated in his public reference to the value of the Corporation Tax act, which has just been declared constitutional, in bringing to the public records information concerning the acts of corporations and the amount of their profits.

It is not hard to see that co-operation among manufacturers to maintain reasonable prices in a period of business depression, or at any time when demand is less than the capacity to produce, will entail obligations which must be met when trade conditions are favorable. If co-operating manufacturers are to say what is a reasonable price, at a time when competition would result in lower prices, they must also satisfy buyers (and shall we say, too, the Government?) that their prices are reasonable when demand is in excess of capacity. It need not surprise them, moreover, if there is a public demand that co-operation be not limited to the manufacturers, but that it include also co-operation between manufacturers and employees. If the question of the reasonableness of the prices of their product is decided by the manufacturers themselves, they may have to satisfy public opinion as to the reasonableness of the wages they pay. The focusing of attention upon co-operative movements in steel and other important industries is bound to bring public opinion to bear more and more upon all the problems of those industries. In this aspect co-operation becomes something more than a temporary expedient for tiding over a period of special difficulty. It must be regarded as a consistent policy, restraining advances when booms set in; always having in mind the interests of the consumer as well as the producer; satisfying the workman, as well as enlightened public sentiment, that the wages paid are "a fair proportion of the earnings of the business." In short, co-operat-

ing manufacturers must accept responsibilities corresponding with the important functions they assume in deciding at what level prices for their products shall be maintained. In this aspect of the present movement in the American steel trade, we may expect to see, under the new régime, only moderate prices and profits. Pointing in the same direction, as has been already indicated in these columns, is the Government check to freight rate advances, with its effect upon the prices of railroad labor and of those commodities for which the railroads make the largest outlay.

A New Metal Perforating Process

If the reader were to be asked how metal a quarter of an inch thick or thicker might be perforated with slots 1/1000 or even 1/32 in. wide he would probably answer, as did all experts who were consulted in the matter, that he did not know. Some men went so far as to say that it is impossible, and that the inquirer was wasting time to look for means to do it. By all orthodox methods of punching, it is impossible, and the rule is well established that it is impracticable to punch slots narrower than the thickness of the metal through which they are punched. How the inquirer, Andrew Smith of San Mateo, Cal., succeeded in obtaining his end is explained in an article in another part of this issue. Interesting as were his first schemes for approximating the desired results, the final solution so perfectly accomplished it and was so altogether novel, that it deserves recognition as a new process for metal perforating. Briefly it consists of cracking the metal on rows of parallel lines of cleavage perpendicular to its surface and then opening the cracks by stretching the metal. The cracking is done by depressing and raising alternate sections so that the metal is sheared on the intermediate lines and then after rolling them back the stretching is done by rolling the metal in the solid parts between the rows of cracks. While the process was one developed specifically for perforating well casings, it is very probable that many other useful applications will be found for it. Pipes so perforated have already been put to two closely allied uses: the draining of surface soil by buried pipes and, reversely used, the irrigating of soil by water distributed through such pipes laid in the ground.

Checking Unfair Complaints of Subordinates

When a controversy arises with a house operating large works concerning a machine delivered by a dealer or builder, the latter should make the effort to bring the details of the case before some higher official. A recent analysis of a typical case showed that the complaint of a department superintendent which had caused a machine to be shipped back to the factory had never reached any one higher in authority except as a mere generality. An injustice had been wrought because the affair had not been forced beyond the sphere of subordinates.

Many buyers build equipment entirely foreign to machine tools, concerning which they know very little. A great many purchases are for machine shops used only for the building and repair of equipment employed in manufacturing, so that the management is still farther removed in its knowledge of what is good and what is not. Dependence must be placed upon the

statements of those who superintend the operation of the tools. If such a man makes complaint of a machine the manager must believe him, unless the machinery house gets a hearing. It has been demonstrated that fair treatment usually follows the hearing of the other side of the affair.

In one case a perfectly good machine was rejected as unfit because of alleged imperfections in design and construction, when as a matter of fact it was a duplicate of several already in successful use in the customer's works. These had exceeded expectations and the later order was unnecessary. A subordinate, who had recommended the additional purchase, undertook to put the machine back on its builder and was successful. Had the details of this transaction come to the personal attention of the man higher up, the chances are that justice would have prevailed and a friendly adjustment would have been effected. A great majority of the men big enough to be chosen for the higher executive offices of a large concern are broad-gauge and fair minded. Even a personal letter to secure the requisite attention may be justified, where the seller stands to suffer not only an immediate money loss but the more serious menace of a damaged reputation for his products.

Navy Department Perplexity

An interesting condition of affairs confronts the United States Navy Department in consequence of the attempt to placate organized labor and anti-corporation sentiment in Government appropriation bills. It will be remembered that the Navy Department was balked last year in its efforts to keep within the appropriation the cost of building a battleship at a Government yard, by the provision inserted in the appropriation act restricting the working day on it to 8 hours. The appropriation act for this year's naval programme introduces some new restrictive features. Not only is the attempt made to enforce the 8-hour provision on private shipbuilding companies, who may take contracts for building battleships, but the Navy Department is prevented from expending any part of the amount appropriated for the purchase of structural steel, ship plates, armor, armament or machinery "from any persons or firms or corporations who have combined in monopoly or in any restraint of trade," and the department is forbidden to buy any steel at a price in excess of a reasonable profit above the actual cost.

It is possible that the legal advisers of the Government may point out a way by which these provisions of the appropriation act can be complied with, or at least how they may be construed so as to enable the department to advertise for bids with some certainty that shipbuilders will respond. The shipbuilders are unquestionably anxious for work and Government contracts would be most acceptable to them, but, as a matter of course, the first consideration will be to assure themselves that the work can be turned out with some margin of profit. It would by no means be surprising if the Government should be unable to place these contracts.

The Ajax Mfg. Company, Cleveland, has received an order from the Atlantic Coast Line Railroad for a set of reclaiming rolls for rerolling railroad scrap into smaller sizes of commercial bars. A similar order was recently received from the Central Railroad of Georgia.

Correspondence

Ferromanganese in Car Wheel Iron

To the Editor: In *The Iron Age* of March 9, page 605, there is an article entitled "A New Charcoal Pig Iron for Chilled Car Wheels," being mainly excerpts from a pamphlet issued by a concern making the so-called new metal. Indisputable statements of fact are here interwoven ingeniously with plausible special pleading, the net result of which is, in my judgment, altogether misleading. For example:

High sulphur with manganese effects a combination which produces a coarse chilled crystallization, which can be readily separated under distinct lines of cleavage, and which, under excessive heating and cooling, due to brake service, causes cracking and disintegration of tread and flange. The strength of the ordinary cast iron wheel of to-day is dependent entirely on the use of ferromanganese, and with its use there is no difficulty in meeting the M. C. B. specifications of "drop" and "thermal" tests.

The foregoing statements are correct, but immediately following comes the special pleading which, I claim, is altogether wrong, and, as I was responsible for the original introduction of 80 per cent. ferromanganese into car wheel mixtures 30 years ago (without any patent reservations or other restrictions or emoluments), I feel called upon to defend the process from unwarrantable aspersions cast upon it at this late day.

Between the years 1880 and 1888 I made considerably more than a thousand tests of the deleterious effect of high manganese (initially existing in some irons) upon the crystalline structure and wearing quality of the "chill" in a car wheel, and also upon the remarkably beneficial effect produced upon the unchilled or gray iron portion of a chilled cast iron car wheel without injuring the chill by adding to the ladle, a moment before pouring the metal into the mold, a minute quantity (actually 1 lb. in 600 lb. or more of iron) of powdered ferromanganese containing about 80 per cent. manganese. The total quantity of manganese thus added to the metal, even assuming that it all entered into combination and alloyed with the iron is entirely too small to produce any harmful influence, or even visible change in the character of the chilled iron crystals, such as is stated in the article referred to. In point of fact, the very small quantity of manganese thus added in form of ferromanganese is instantly seized upon by the sulphur and the oxygen in the iron, on account of the strong affinity of these elements for each other, and a characteristic surface action on the molten metal is at once noticeable, due to the rising to the surface of these impurities in the form of a light slag. The visible effect upon the gray iron in the plate and arms or ribs of a car wheel thus treated is striking indeed, changing it from a light gray color to dark gray, and from close grain to open grain; the "chill" is slightly diminished in depth, but is not otherwise changed.

The strength of the gray iron in the car wheel thus treated is increased nearly 50 per cent., and I believe it is universally admitted now that the introduction of ferromanganese in the precise manner and quantity that I described in my original paper, printed in the *Journal* of the Franklin Institute March, 1888, saved the day for the chilled cast iron car wheel when the Pennsylvania Railroad subsequently devised its severe "thermal test." Without this treatment the best annealed wheels cracked under this novel test, but, owing to the increase in ductility and strength of the metal, caused by this remarkable deoxidizing and desulphurizing agent, there is, as stated in your paper, no difficulty to-day in meeting the M. C. B. specifications of drop and thermal tests. On remelting, the effect of the small addition of ferromanganese disappears. It is *not* emulative.

These facts were all set forth succinctly in the paper alluded to, a copy of which is forwarded herewith and have never been refuted.

ALEXANDER E. OUTERBRIDGE, JR.

Philadelphia, March 10, 1911.

NOTE.—The pamphlet containing Mr. Outerbridge's paper of 1888, as referred to above, has the following on the difference between high manganese iron and a

normal iron treated with a small amount of 80 per cent. ferromanganese.—EDITOR.

Manganese is commonly supposed to exert a hardening tendency upon pig iron, but experience has taught me to regard this as another mistaken notion. It undoubtedly produces a marked effect upon the character of the white crystalline structure. You may readily recognize "a manganese chill" by its coarse lamellar or foliated filaments and by the tendency which it produces to form white iron or "hard spots" in isolated places throughout the gray portion of a casting. Manganiferous pig iron has been used to produce chilled castings, but it does not make a durable wearing surface; the chilled tread of a car wheel, for example, produced by this method, presents to the eye, when broken through the section, a handsome appearance, but the white metal is comparatively soft; it may be easily bored, and, what is more serious, it crumbles readily under the impact of rapid shocks on the rail.

A remarkable effect is produced upon the character of hard iron by adding to the molten metal, a moment before pouring it into the mold, a very small quantity of powdered ferromanganese, say 1 lb. of ferromanganese in 600 lb. of iron, and thoroughly diffusing it through the molten mass by stirring with an iron rod. The result of several hundred carefully conducted experiments which I have made enables me to say that the transverse strength of the metal is increased from 30 to 40 per cent., the shrinkage is decreased from 20 to 30 per cent., and the depth of the chill is decreased about 25 per cent., while nearly one-half of the combined carbon is changed into free carbon; the percentage of manganese in the iron is not sensibly increased by this dose, the small proportion of manganese which was added being found in the form of oxide in the scoria. The philosophical explanation of this extraordinary effect is, in my opinion, to be found in the fact that the ferromanganese acts simply as a deoxidizing agent, the manganese seizing any oxygen which has combined with the iron, forming manganic oxide, which being lighter than the molten metal, rises to the surface and floats off with the scoria. When a casting which has been artificially softened by this novel treatment is remelted, the effect of the ferromanganese disappears and hard iron results as a consequence.

New Publications.

Applications Industrielles de l'Electricité. (Industrial Applications of Electricity). By L. Creplet, chief service engineer of the International Electricity Company, Liege, Belgium. Size 6 x 9 in., 274 pages, 300 illustrations. On sale at the Association of Liege Engineers, Quai de l'Université, Liege, Belgium.

Electricity has been characterized as a form of energy, in the same sense as light, heat and mechanical energy and capable of transformation into any of the other forms of energy. What it is and how and why it may be transformed into work are questions of theory affecting only the relatively smaller number of electrical experts, but what it does, or its practical application, is the phase of the subject which is of interest to manufacturers at large.

Appealing rather to the mechanical than to the electrical engineer, the carefully prepared work of M. Creplet, which has now reached its second edition, covers the ground in concise and practical form. It is avowedly written for the benefit of technical men who have not had the opportunity of making a special study of electricity, but who, in their professional capacity, are called upon to deal with its industrial applications. As the author remarks, those already versed in electricity will find but little to interest them in his work, which is rather intended to afford engineers in general the guidance they require for determining the elements without which the constructors of electrical machinery could not furnish dynamos or other apparatus suitable for fulfilling the conditions required. It may, however, be doubted whether M. Creplet's work may not still prove of value to the expert desirous of following out to their solution questions affecting the applications of electricity. Liberal use is made of algebraic formulas in the 107 practical examples with which the text is interspersed.

In dealing with general principles, it is remarked that the mechanical energy utilized in dynamos is almost integrally converted into electricity; it being through these means that the latter is, in the majority of cases, produced for industrial purposes. Another source of electricity is the chemical energy put in action in piles and accumulators. M. Creplet adds:

"The machines which produce electricity hold a close analogy to steam-boilers. The latter receive energy

in the form of heat. We are totally ignorant as to the phenomena by which the energy is converted into steam under pressure. This appears to us, however, quite natural. So true is it that we get accustomed to the strangest things, provided they are frequently manifested to us. It is apparently an analogous mystery which attends the transformation of mechanical energy into electricity."

From the manufacturer's point of view, much interest attaches to the chapter dealing with the tests of electrical machinery, which will permit of judgment being formed of its construction and working capacity. Such tests would naturally deal with the questions of insulation, temperature, speed, overloading and other points more or less of a mechanical character. Another chapter of special importance is that treating of the various accessory instruments and appliances intended to insure the regular operation and preservation of the equipment, as well as the immunity from danger, of the working staff. The discussion of the relative merits of direct and alternating current in certain given cases will likewise be appreciated from a practical standpoint.

The arrangement of the book is singularly clear, and M. Creplet has unquestionably accomplished his object of producing a work that may facilitate the increased use of electricity for industrial purposes by spreading practical knowledge on the subject.

Engineering Index Annual, 1910. Compiled from the Engineering Index, published monthly in the Engineering Magazine during 1910. Twenty-seventh year. Size, 7 x 9½ in.; pages, 490. Price, \$2. Published by the Engineering Magazine, New York and London.

So well known is this index of the engineering matter appearing in some 250 of the leading periodicals that it scarcely calls for comment. An important innovation made in the 1910 volume just issued is the condensed classification of the index in the introductory pages giving all of the catch-words under the various subjects in the main classifications and the page references. It has greatly added to convenience in the use of the book, being a compact summary of all subjects treated, so that by the turning of a relatively few pages the user will quickly discover whether or not anything has appeared on the subject he is interested in, without the slower and more tedious examination of the body of the book.

Other than this the book is similar to previous issues, but shows a growth and development natural with the progress of industry and the increased amount of published information, and its subheadings and cross references have been somewhat amplified correspondingly. The first four volumes of the work appeared at five-year intervals, but since 1906 the index has been issued annually to keep it up to date, and particularly as a great deal of engineering matter becomes obsolete in a five-year period. In this book as in the annual volumes previously issued the classified system of arranging the items is followed in place of the strict alphabetical order of the earlier volumes, the great advantage of which is that it brings together the items of interest to any individual instead of scattering them through the entire work. The classifications themselves and the subdivisions under them do follow alphabetical arrangement. Unquestionably the arrangement accomplishes all that is possible to facilitate a search of the book.

The Baldwin Locomotive Works, Philadelphia, reports the bulk of recent orders as being small individually, although several very satisfactory inquiries, including one for 29 engines for the Atlantic Coast Line and another from the Illinois Central for a considerable number, are being figured on. One order for six engines for the Georgia Railroad has just been entered. The Baldwin Works is hardly as busy as it was a few months ago; working forces have not been reduced, but in some instances full time is not being made.

The American Bridge Company shipped by river from its plant at Ambridge, Pa., a steel dry dock for the Third District Government fleet, which arrived at Vicksburg, Miss., last week.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Mar. 15, 1911.	Mar. 8, 1911.	Feb. 15, 1911.	Mar. 16, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	\$15.50	\$15.50	\$15.50	\$18.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	16.25
Foundry No. 2, Birmingham, Ala.	11.00	11.00	11.00	13.00
Foundry No. 2, local, Chicago	15.50	15.50	15.50	18.25
Basic, delivered, eastern Pa.	15.25	15.25	14.50	18.50
Basic, Valley furnace	13.75	13.75	13.75	16.00
Bessemer, Pittsburgh	15.90	15.90	15.90	18.65
Gray forge, Pittsburgh	14.40	14.40	14.40	16.15
Lake Superior charcoal, Chicago	17.50	17.50	17.50	19.50

BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh	28.00	28.00	28.00	32.00
Open hearth billets, Philadelphia	25.40	25.40	25.40	30.60
Wire rods, Pittsburgh	29.00	29.00	29.00	33.00

OLD MATERIAL, Per Gross Ton:

Iron rails, Chicago	15.50	15.50	15.50	19.00
Iron rails, Philadelphia	18.50	18.50	17.50	20.50
Car wheels, Chicago	13.25	13.25	13.00	17.00
Car wheels, Philadelphia	14.00	14.00	13.50	16.75
Heavy steel scrap, Pittsburgh	14.25	14.75	14.50	17.00
Heavy steel scrap, Chicago	12.00	12.00	11.75	15.00
Heavy steel scrap, Philadelphia	14.00	14.00	14.00	16.50

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.37½	1.37½	1.35	1.57½
Common iron bars, Chicago	1.27½	1.27½	1.30	1.55
Common iron bars, Pittsburgh	1.35	1.35	1.35	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.61
Steel bars, Pittsburgh	1.40	1.40	1.40	1.45
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	1.30	1.30	1.30	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.80	1.80	1.75	1.85
Cut nails, Pittsburgh	1.60	1.60	1.60	1.85
Barb wire, galv., Pittsburgh*	2.10	2.10	2.05	2.15

METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.62½	12.75	13.75
Electrolytic copper, New York	12.25	12.25	12.37½	13.50
Spelter, New York	5.65	5.65	5.57½	5.73
Spelter, St. Louis	5.50	5.50	5.42½	5.58
Lead, New York	4.37½	4.40	4.45	4.50
Lead, St. Louis	4.22½	4.25	4.30	4.35
Tin, New York	39.75	41.75	45.75	31.70
Antimony, Hallett, New York	9.25	9.25	7.75	8.25
Tin plate, 100-lb. box, New York	\$3.94	\$3.94	\$3.94	\$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net;

angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼ in. to and including 3-16 in. on thinnest edge	\$0.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Roller and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.50
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, 20, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, \$1.55 per square. Galvanized sheets, No. 28, \$2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
1½, ¼, ⅝ in.	72	58	68	54
1½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½			
Butt Weld, extra strong, plain ends, card weights.				
1½, ¼, ⅝ in.	69	59	65	55
1½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
1½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

THE IRON AND METAL MARKETS

Plugged and Reamed.
1 to 1½, 2 to 3 in. Butt Weld Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or Lap Weld as specified.
2, 2½ to 4 in. Lap Weld The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1½ to 2¼ in.	61	43
2¼ in.	63	48
2½ to 3 in.	69	55
3 in. and smaller, over 18 ft., 10 per cent. net extra.		
3 in. and larger, over 22 ft., 10 per cent. net extra.		

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, \$29.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ½ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, March 15, 1911.—(By Telegraph.)

Pig Iron.—The market continues very quiet, inquiry being light and only for small lots. Prices are weak. A sale of 1000 tons of standard Bessemer for April, May and June is reported at \$15, at furnace, the maker paying a small commission to the broker. We quote Bessemer pig iron, \$15; malleable Bessemer, \$13.75; basic, \$13.75 to \$14; No. 2 foundry, \$13.75 to \$14, and gray forge, \$13.50, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—New buying of steel is very light. Most consumers of billets and sheet and tin bars are covered ahead and are specifying freely on their contracts. The Cambria Steel Company is operating this week 24 of its 25 open hearth furnaces and will blow in the last of this week another blast furnace, making all its eight stacks in blast. We quote Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at \$23, base, and sheet and tin bars in 30-ft. lengths, \$24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at \$24 and forging billets at \$28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(By Mail.)

Reports from the heads of the sales departments of a number of the leading steel interests show clearly that the volume of new business in iron and steel products has fallen off very much as compared with two or three weeks ago. Consumers do not take much interest in the market, usually buying only such material as they absolutely must have. The calling of an extra session of Congress seems to have put a damper on trade. While former prices are still being quoted on pig iron, there is very little buying and only in small lots. Specifications from consumers of billets and sheet bars are still coming in quite freely, and the steel market is fairly active. In finished lines of iron and steel the new demand is quiet. The recent advance in wire products is being maintained, but jobbers and retailers were covered ahead for 60 days or more, and new buying in the last 10 days has been light. The scrap market is also dull, and prices on heavy steel scrap, cast iron borings and wrought turnings have gone off. There is more inquiry for coke and the tone of that trade is a little stronger. A leading Valley furnace interest has bought about 60,000 tons of furnace coke for last half delivery on the basis of about \$1.80 per net ton, at oven.

Ferromanganese.—The market is very dull and prices are weak. Dealers are asking \$37.50 to \$37.75, Baltimore, for 80 per cent. for the remainder of this year, but it is reported that the lower price has been shaded in some re-

cent transactions. We quote 80 per cent. foreign for prompt shipment at about \$37.25, and for forward delivery at \$37.50 to \$37.75, Baltimore. The freight rate for delivery in the Pittsburgh district is \$1.95 a ton.

Ferrosilicon.—The demand has subsided and prices are extremely weak. We quote 50 per cent. at \$53.50 to \$54, f.o.b. Pittsburgh, for delivery up to July; 10 per cent. blast furnace silicon, \$23; 11 per cent., \$24, and 12 per cent., \$25, f.o.b. cars, Jisco and Ashland furnaces.

Muck Bar.—In the absence of sales, we quote best grades of muck bar made from all pig iron at nominally \$30, Pittsburgh.

Skelp.—No sales of moment have recently been made, but prices are firm. The skelp mills in this district are pretty well filled up for some time. We quote grooved steel skelp at 1.30c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Wire Rods.—Most consumers covered their requirements to July 1 or longer before the recent advances in prices were made, so that the new demand is light. Specifications against contracts are coming in at only a fairly satisfactory rate. We quote Bessemer, open hearth and chain rods at \$29 to \$30, Pittsburgh, most makers quoting the higher price.

Steel Rails.—No important orders for standard sections have been taken by the Carnegie Steel Company in the past week, but it is receiving some good sized orders for standard section rails for export. This business coming through the United States Steel Products Company. Business in light rails in the past week was fairly active, new orders and specifications against contracts aggregating about 4000 tons. The three rail mills of the Carnegie Steel Company at Bessemer, Pa., are operating to about only 50 per cent. of capacity at present. Prices on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per pound.

Plates.—There is a fair amount of new buying of a hand to mouth character, but no contracts calling for large tonnages are being placed. Car orders are scarce. The Pressed Steel Car Company took in the past week 100 steel mine cars for the Gulf Smokeless Coal Company and 10 flat cars for the Berwind Lumber Company, and the Standard Steel Car Company took 60 box cars and 50 refrigerator cars for the Ann Arbor Railroad and 50 box cars for the Richmond, Fredericksburg & Potomac Railroad, the latter to be built at its South Baltimore, Md., shops. The Atlantic Coast Line is in the market for 1200 cars and the Western Maryland for about 500 cars. The Carnegie Steel Company is now rolling about 3500 tons of plates and shapes for a new passenger boat for the Cleveland & Detroit Navigation Company, and the Philadelphia Company of this city is in the market for 2500 to 3000 tons of plates for a gas holder. We quote plates ¼ in. and heavier in the wide sizes at 1.40c., Pittsburgh.

Structural Material.—New inquiry is rather light, especially from the railroads, which have been buying very little material for some time. The Jones & Laughlin Steel Company has taken about 4000 tons for the new prison at Wingdale, N. Y., and about 800 tons for a highway bridge in Venango County, Pa. The McClintic-Marshall Construction Company has taken 400 to 500 tons for new buildings for the Brightman Mfg. Company, Columbus, Ohio, and the McMyler Interstate Engineering Company, Bedford, Ohio, has taken about 350 tons for a new interurban depot at Columbus, Ohio. The Dravo Contracting Company of this city is the lowest bidder on the piers for the new bridge across the Allegheny River in this city, which will require about 500 tons of sheet steel piling and shapes for the substructure; the main structure will take from 5000 to 7000 tons, but this will probably not be let for some time. We quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

Tin Plate.—Specifications from heavy consumers are coming in quite freely, but the new demand is light, as is usual at this season. The American Sheet & Tin Plate Company started up on Monday its Chester Works at Chester, W. Va., containing seven hot tin mills, this plant having been closed for about three weeks for boiler and engine repairs. It closed six mills at its American Works at Gas City, Ind., to rebuild some heating furnaces. The company is operating this week 198 out of a total of 225 hot tin mills, or about 86 per cent. Reports are that plans are under way for the building of another large tin plate plant in the Pittsburgh district, but nothing definite regarding this has been given out. Prices on tin plate are being

THE PITTSBURGH STEEL & IRON WORKS & SONS.
Mechanical and Civil Engineers.
PITTSBURGH, PA.

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maintained at \$3.70 per base box of 100-lb. cokes, f.o.b. Pittsburgh.

Sheets.—The demand is below expectations, and specifications against contracts are not coming in as freely as desired; in fact, the present condition of the sheet trade is a disappointment to the mills. The American Sheet & Tin Plate Company is operating this week about 60 per cent. of its capacity in sheet mill products, and a majority of the outside mills are operating at about the same rate. With two or three weeks of good weather the demand for roofing sheets and other grades as well would probably show betterment. Regular prices in the different grades of sheets are printed on a previous page.

Bars.—The implement makers are specifying in a fairly liberal way against their contracts, but so far have shown no disposition to enter the market to make new contracts for their 1911-1912 requirements. The implement makers are covered up to July 1, and as long as there is no probability of higher prices for steel bars they will likely be slow in making new contracts. The demand for concrete bars is light, but will probably improve when the building season opens. The tone of the market on iron bars is only fairly strong, and new orders and specifications are not satisfactory. We quote steel bars at 1.40c. and iron bars at 1.35c., f.o.b. Pittsburgh.

Hoops and Bands.—Consumers are buying mostly in small lots, merely to cover actual needs, and specifications against contracts are coming in only at a fairly satisfactory rate. We continue to quote steel hoops at 1.50c. and bands at 1.40c., with extras on the latter as per the present steel card, but are advised that on some contracts taken recently the prices on both hoops and bands were slightly shaded.

Spikes.—A fair tonnage in spikes is moving out from the mills to the railroads, and the Pittsburgh & Lake Erie of the New York Central Lines has recently placed a contract for 5000 kegs, while the Northern Pacific has an inquiry out for 3000 kegs. Prices on spikes are firm, at \$1.55 for base sizes, but this price holds good only until March 31, and commencing April 1 all spike makers will quote on the basis of \$1.60. Prices on railroad spikes, with extras in effect until March 31, are as follows:

Railroad Spikes.

4 1/2, 5 and 5 1/2 x 9/16	.....\$1.55
3, 3 1/2, 4, 4 1/2 and 5 x 1/2	.....Extra .10
3 1/2, 4 and 4 1/2 x 7/16	.....Extra .20
3, 3 1/2, 4 and 4 1/2 x 5/16	.....Extra .30
2 1/2 x 3/4	.....Extra .40
2 1/2, 3 and 3 1/2 x 5/16	.....Extra .60
2 x 5/16	.....Extra .80

Boat Spikes.

3/4 in. square, 12 to 24 in. long	.....Extra .15
3/4 in. square, 8 to 16 in. long	.....Extra .15
1/2 in. square, 6 to 18 in. long	.....Extra .15
7/16 in. square, 6 to 12 in. long	.....Extra .20
3/8 in. square, 4 to 12 in. long	.....Extra .30
7/16 in. square, 4 to 8 in. long	.....Extra .45
1/2 in. square, 4 to 8 in. long	.....Extra .75
1/4 in. square, 3 to 3 1/2 in. long	.....Extra 1.00
3/4 and 5/16 shorter than 4 in., 1/4 cent extra.	

Spelter.—The market is slightly easier, and while most of the Western smelters are quoting on the basis of 5.50c., East St. Louis, some consumers report they have been able to place orders at slightly under this price. We quote prime grades at 5.45c. to 5.50c., East St. Louis, equal to 5.57 1/2c. and 5.62 1/2c., Pittsburgh.

Merchant Steel.—New orders continue to be closely confined to small lots, and specifications against contracts are not quite as active so far this month as in the same period in February. Consumers are disposed to go slow in making contracts. Prices are said to be very firm, and we quote, f.o.b. Pittsburgh: Iron finished tire, 1/2 x 1 1/2 in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—The demand is only fair, mostly for small lots, and specifications against orders are not coming in as they should. There is a slight betterment in the demand for boiler rivets, but structural rivets are very quiet. Prices are shaded on attractive orders.

Wire Products.—Jobbers and retailers were pretty well covered prior to the advance in prices March 6, and as a result the new demand has been rather quiet for the past week or more. Specifications against jobbers' contracts are being received by the mills very freely. The outlook is promising for a very heavy consumption of wire for fence building and other purposes this year. We quote galvanized barb wire at \$2.10; painted, \$1.80; annealed fence wire, \$1.55; galvanized, \$1.90; wire nails, \$1.80; and cut nails, \$1.60 to \$1.65, f.o.b. Pittsburgh, full freight to destination added.

Merchant Pipe.—The new demand for merchant pipe from jobbers and retailers has been showing a slow but gradual increase for some time, and the amount of new

business entered by the mills so far this month is as large as in the same period last month. With two or three weeks of mild weather there would, no doubt, be quite a spurt in the demand for merchant pipe. Stocks held by jobbers are probably lighter than for some months. The only inquiry reported in the market for line pipe is one for 45 miles of 16-in. from one of the gas companies at Shreveport, La. It is stated that regular discounts on iron and steel pipe, printed on a previous page, are being fairly well maintained.

Boiler Tubes.—There is no improvement in the new demand for either locomotive or merchant tubes. The boiler tube trade has been very unsatisfactory to the mills for more than a year. It is said that boiler tubes have sometimes sold at prices that, to some mills at least, were below cost.

Coke.—The coke market is showing signs of a betterment in demand, and prices are firmer. A Valley interest closed for 8000 to 10,000 tons monthly of furnace coke for delivery up to July 1, on the basis of \$1.60 per net ton, at oven, and for the same tonnage for July to December, at \$1.80. These prices are probably lower than the actual market. An Eastern furnace interest is in the market for about 10,000 tons of coke per month over the remainder of the year. There is more disposition among consumers of furnace and foundry coke to close for their full requirements for the remainder of the year. It is recognized that present prices are now low and any improvement in the pig iron trade would probably result in higher prices on coke. We quote standard grades of furnace coke for prompt shipment at \$1.55 to \$1.60 per net ton at oven, and on contracts for delivery over the remainder of the year from \$1.80 to \$1.90 with some makers firm for second half of the year delivery at \$1.90 to \$2 at oven. Standard makes of 72-hour foundry coke are held at about \$2.10 per net ton at oven to dealers and from \$2.25 up to \$2.50 to consumers. We are advised that several makers of the best grades of 72-hour foundry coke have considerable business on their books based on \$2.50 at oven.

Iron and Steel Scrap.—The new demand is light and part of the late advance in prices on heavy steel scrap, borings and turnings has been lost. There is not much pressure on the part of dealers to sell, however, so that it can be said that prices are fairly strong. We note sales of 1200 to 1500 tons of heavy steel scrap on the basis of about \$14.25, Pittsburgh; 200 tons of borings at \$9.50, delivered; 1000 tons of bundled sheet scrap at about \$11.25 at loading point, and 1000 tons of low phosphorus scrap at \$17.50, delivered in the Pittsburgh district. Dealers are naming lower prices on heavy steel scrap, borings and turnings, and now quote as follows, f.o.b. Pittsburgh, or elsewhere as noted:

Heavy steel scrap, Steubenville, Folsbee, Sharon, Monessen and Pittsburgh delivery	.....\$14.25 to \$14.50
No. 1 foundry cast	.....14.50 to 14.75
No. 2 foundry cast	.....13.75 to 14.00
Bundled sheet scrap, at point of shipment	.....11.00 to 11.25
Revolving rails, Newark and Cambridge, Ohio, and Cumberland, Md.	.....15.00 to 15.25
No. 1 railroad malleable stock	.....13.25 to 13.50
Grate bars	.....11.25 to 11.50
Low phosphorus melting stock	.....17.25 to 17.50
Iron car axles	.....24.75 to 25.00
Steel car axles	.....20.50 to 20.75
Locomotive axles	.....24.25 to 24.75
No. 1 bushing scrap	.....12.50 to 12.75
No. 2 bushing scrap	.....9.00 to 9.25
Old car wheels	.....13.75 to 14.00
Sheet bar scrap ends	.....16.00 to 16.25
*Cast iron borings	.....9.75 to 9.50
*Machine shop turnings	.....10.00 to 10.25
Old iron rails	.....16.00 to 16.25
No. 1 wrought scrap	.....14.50 to 14.75
Heavy steel axle turnings	.....10.25 to 10.50
Stove plate	.....11.50 to 11.75

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

The Pittsburgh office of Naylor & Co., Frick Building, dealers in pig iron, steel, wire rods and coke, has been abolished.

Chicago

FISHER BUILDING, March 15, 1911.—(By Telegraph.)

The market is quiet. Inquiries for pig iron have somewhat dropped off, and no sales of importance have been made. Scrap iron has further weakened, and the market is well in the hands of buyers. The demand for structural material is improving as spring advances. Sheet mills have somewhat curtailed their production, but the lull is considered temporary. The advance in the price of wire products which went into effect March 6 has netted more orders this week than were placed the week preceding the well-heralded advance. This speaks convincingly of healthy country conditions. Spring has been coming on gradually in the central and northern States, and frost is pretty well

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out of the ground as far north as Chicago. This condition is welcomed in agricultural districts, where winter froze a dry soil, and puts it in condition to make the most of spring rains.

Pig Iron.—Quietness is noticeable in the entire market. Inquiries for both Northern and Southern irons have somewhat slackened off and few orders are being placed. The price of Southern iron remains at \$11, Birmingham, for No. 2 foundry, for the first half, and \$11.50 for the last half; \$11.50 is also being quoted for the third quarter, supplementing a price of \$11.25, which has been named for some weeks by certain Southern producers. A local foundry is reported to be in the market for 2000 tons of iron, this quantity being about equally divided between Northern and Southern. The inquiry for 3000 tons of basic, reported last week from a local steel foundry, is still pending. The following quotations are for March shipment, Chicago delivery:

Lake Superior charcoal.....	\$17.50 to \$18.00
Northern coke foundry, No. 1.....	16.00 to 16.50
Northern coke foundry, No. 2.....	15.50 to 16.00
Northern coke foundry, No. 3.....	15.25 to 15.75
Northern Scotch, No. 1.....	16.50 to 17.00
Southern coke, No. 1.....	15.85 to 16.35
Southern coke, No. 2.....	15.35 to 15.85
Southern coke, No. 3.....	15.10 to 15.60
Southern coke, No. 4.....	14.85 to 15.35
Southern coke, No. 1 soft.....	15.85 to 16.35
Southern coke, No. 2 soft.....	15.35 to 15.85
Southern gray forge.....	14.60 to 15.10
Southern mottled.....	14.60 to 15.10
Malleable Bessemer.....	15.50 to 16.00
Standard Bessemer.....	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%..	17.90 to 18.40
Jackson Co. and Kentucky silvery, 8%..	18.90 to 19.40
Jackson Co. and Kentucky silvery, 10%..	19.90 to 20.40

(By Mail.)

Billets.—Business continues light and the maximum price of \$30.00, base, Chicago, is being maintained on open hearth forging billets by the leading interest. Open hearth re-rolling billets remain at \$25.60, base, Chicago.

Rails and Track Supplies.—Orders for track materials have been of good volume. Contracts approximating 16,000 tons of standard sections have been received by the leading interest. This business has come in small lots from numerous railroads. Prices are unchanged and firm, as follows: We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.15c. to 2.25c., base, all in carload lots, Chicago. Standard section Bessemer rails, 12c.; open hearth, 1.34c. Light rails, 40 to 45 lb., 1.16c. to 1.20c.; 30 to 35 lb., 1.19c. to 1.24c.; 16, 20 and 25 lb., 1.20c. to 1.25c.; 12-lb., 1.25c. to 1.30c., Chicago.

Structural Material.—The condition of this trade continues good. Specifications are improving and shipping instructions are normal. Railroad buying is quiet. Contracts let last week include the following: Minneapolis General Electric Company, power station, 484 tons, let to Minneapolis Steel & Machinery Company; addition to McCormick Building, Chicago, 1914 tons, to Hansell-Elecock Company; Pantages Amusement Company, theatre and office building, Portland, Ore., 286 tons, to American Bridge Company; city of Janesville, Wis., highway bridges, 325 tons, to Central States Bridge Company; Wabash Railroad Company, bridge No. 390, Peru Division, 400 tons, to American Bridge Company; High School Building, Spokane, Wash., 650 tons, to Minneapolis Steel & Machinery Company; Dearborn Street bridge, Seattle, Wash., 625 tons, to Pennsylvania Steel Company. We quote plain material from mill, 1.58c. to 1.62c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Generous specifications continue to improve business on this product. Mills are very busy and the prospect of a continuance of this activity is bright. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—Specifications against contracts are coming in fairly well, but buying has dropped off. Mills are operating at about 45 per cent. of their capacity. This is believed to be but a temporary lull. Prices are well maintained. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Bar iron has continued to firm up and is now considered steady. Steel bars have been fairly active, the demand being improved by specifications for concrete reinforcement material. An optimistic trend governs the market. Prices are firm, as follows: Soft steel bars, 1.58c.; bar iron, 1.27c. to 1.32c.; hard steel bars rolled from old rails, 1.35c. to 1.40c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—Following the recent advance in the price of wire products has come an increase rather than a decrease in business. This is something of a surprise, as buyers were well warned. It speaks volumes for the good

condition of farming districts. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c.; polished staples, 1.98c.; galvanized staples, 2.28c., all Chicago.

Cast Iron Pipe.—Business is quite active and numerous small sales have been made. The city of Minneapolis, Minn., has contracted with the leading interest here for 3500 tons. Dayton, Ohio, is in the market for 500 tons. Gas companies have been liberal buyers though most contracts have come from smaller companies. Prices continue firm, as follows, per net ton, Chicago: Water pipe, 4-in., \$25.50; 6 to 12 in., \$24.50; 16-in. and up, \$24, with \$1 extra for gas pipe.

Old Material.—A further decline in the price of scrap is noted this week. The apparent scarcity of scrap during the past few weeks has been forgotten and mills are receiving offers of material from every quarter. It is purely a buyer's market. The Santa Fe's list, containing approximately 24,000 tons, closed March 10 and has not been sold, prices bid on practically every item being decidedly less than those of a month ago. Prices are for delivery to buyers' works, all freight and transfer charges paid, and are as follows per gross ton:

Old iron rails.....	\$15.50 to \$16.00
Old steel rails, re-rolling.....	13.5 to 14.00
Old steel rails, less than 3 ft.....	12.75 to 13.25
Relaying rails, standard sections, subject to inspection.....	23.00 to 24.00
Old car wheels.....	13.25 to 13.75
Heavy melting steel scrap.....	12.00 to 12.50
Frogs, switches and guards, cut apart.....	12.00 to 12.50
Shovelling steel.....	11.50 to 12.00

The following quotations are per net ton:

Iron angles and splice bars.....	\$13.00 to \$13.50
Iron arch bars and transoms.....	15.00 to 15.50
Steel angle bars.....	11.50 to 12.00
Iron car axles.....	19.25 to 19.75
Steel car axles.....	18.00 to 18.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	11.25 to 11.75
Steel knuckles and couplers.....	11.50 to 12.00
Locomotive tires, smooth.....	17.50 to 18.00
Steel axle turnings.....	8.00 to 8.50
Machine shop turnings.....	7.00 to 7.50
Cast and mixed borings.....	5.75 to 6.25
No. 1 bushelling.....	10.00 to 10.50
No. 2 bushelling.....	7.75 to 8.25
No. 1 boilers, cut to sheets and rings.....	8.50 to 9.00
Boiler punchings.....	13.00 to 13.50
No. 1 cast scrap.....	12.00 to 12.50
Stove plate and light cast scrap.....	10.25 to 10.75
Railroad malleable.....	11.00 to 11.50
Agricultural malleable.....	10.00 to 10.50
Pipes and flues.....	8.75 to 9.25

Philadelphia

PHILADELPHIA, Pa., March 14, 1911.

While there may have been some slight recession in pig iron buying during the week, owing, to a certain extent, to stiffening prices, the movement in finished materials appears to have been fully maintained, and, in some instances, it exceeded that for the previous week. One Eastern plate mill began the week at full rolling capacity, for the first time in months. Higher prices are being paid for foundry iron, particularly on non-competitive business. The Eastern Pig Iron Association, which met in this city, reports more favorable general conditions. Orders have increased, while stocks have receded. In some grades of pig iron a shortage for early delivery is believed not unlikely. There is still considerable inquiry for iron for forward delivery, although little business has been placed. Plates and shapes have been more active, but the demand for billets and sheets continues quiet. The old material market remains quiet. Considerable business in coke is pending, but no important transactions have been closed.

Iron Ore.—While more interest is shown by consumers, with a fair amount of business pending, no sales of importance have been recently reported. Importations at this port for the week ending March 11 aggregated 14,758 tons, valued at \$69,059.

Pig Iron.—While some sellers report continued active buying, others note a decline in sales. Hesitancy has been largely due, it is believed, to the upward tendency of prices. A higher range has been obtained for foundry grades in a number of instances, both for competitive and non-competitive business, although several producers are still willing to sell No. 2 X at \$15.50, delivered, for shipment over the remainder of the first half. At the same time standard brands of that grade have been sold in moderate lots at \$15.75 and \$16, delivered. Transactions in foundry iron have been largely confined to quantities ranging from carloads to a few hundred tons, for either prompt or second quarter. While there is considerable inquiry for iron for delivery in the third quarter, or even for more extended periods, sellers still hesitate when it comes to quoting for

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such delivery, because of the uncertainty as to prices of ore still prevailing. Melters of low grade iron continue active inquirers for prompt and forward iron. One interest would take on a large block if favorable prices could be had, while another is out with an inquiry for 5000 tons for May and June shipment. Northern low grade irons have been gradually becoming scarce and sellers have decidedly higher ideas regarding prices. Northern forge iron is still in good demand, one inquiry for 3000 tons being in hand, but no large sales are reported. The movement in Virginia foundry grades has been active, with a number of moderate sales of No. 2 X and No. 2 plain for delivery in this vicinity, including one lot of 1000 tons at \$13, furnace, for delivery extending up to June. A sale of a round lot of low grade iron, understood to have been 3000 tons, to a Virginia cast iron pipe maker, is also reported. Virginia makers are now holding firmly at \$13, furnace, for No. 2 X foundry, for prompt or second quarter shipment. A further movement of basic iron in this territory is noted. Apparently it is still possible to do \$15.25, delivered, eastern Pennsylvania mill, for this grade, one interest which has been buying quite freely of late having taken two 5000-ton blocks at that price, for delivery in the second and third quarters. Makers contend that there is little iron available at that figure, and several producers state that they will accept no further business at that level. Sales of moderate lots of low phosphorus iron continue to be made for early shipment, and prices are gradually advancing, due to the probability of a shortage in the supply. One producer of standard iron of this grade is preparing to blow out its furnace for needed repairs. The following range of prices is named for standard brands, delivered in buyers' yards in this vicinity, shipments for the most part not extending beyond the first half of the year:

Eastern Pennsylvania, No. 2 X foundry.	\$15.50 to \$16.00
Eastern Pennsylvania, No. 2 plain.	15.25 to 15.50
Virginia, No. 2 X foundry.	15.80 to 16.00
Virginia, No. 2 plain.	15.80 to 16.00
Gray forge.	14.50 to 15.00
Basic.	15.25 to 15.50
Standard low phosphorus.	21.50 to 22.00

Ferromanganese.—The past week has brought out a few inquiries from consumers in this district. Several 100-ton lots for early delivery and one 500-ton lot for shipment over the remainder of the year are under negotiation. In the absence of sales prices are nominally quoted at \$37.50, Baltimore, for second quarter, and \$38, Baltimore, for second half delivery.

Billets.—While there is an occasional betterment in the demand, the market drags. Consumers are confining themselves to small purchases for near future requirement, and are not disposed to place business for extended requirements. Makers in this district are not very fully engaged and have little forward business on their books. Prices, however, are fully maintained at \$25.40, for rolling and \$30.40 for ordinary forging billets, delivered in this vicinity.

Plates.—Eastern mills report an increase in orders, which in some instances are of larger size, upward of 500-ton lots being more frequent. Specifications have also been heavier. The range of the demand is wider, although that for tank plates has been the more pronounced. One Eastern mill began operations on Monday at full rolling capacity, and, from present indications, will be able to continue that rate for some time against business already on its books. Prices are firmly held at 1.55c., minimum, for ordinary plates delivered in this territory, and makers are not anxious to contract for extended shipment.

Structural Material.—A trifle better demand for plain shapes, as well as small fabricated work, is reported. The larger propositions, however, such as the Curtis warehouse and the Baltimore Bargain House, are still unclosed, although expected to be placed at an early date. Some small bridge work has been placed and the Eastern Steel Company has the contract for a 125-ton bridge for the Pennsylvania Railroad at Fricks Lock, Pa. A number of small building contracts, ranging from 50 to 200 tons, are under negotiation, and both makers of shapes and fabricators look forward to a better demand in the near future. Prices of plain shapes are firm at 1.55c., delivered in this vicinity.

Sheets.—Eastern mills are still working on day to day orders and have not been able to get up to the full capacity mark. Orders are plentiful, but confined to small lots for early delivery. There is no indication of immediate buying in quantity. The following range of prices is maintained by Eastern makers, for prompt and near future shipments: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—A moderate demand for refined iron bars continues. While recent sales have been small, some fair business is pending. Eastern bar iron makers are holding prices firmly; while 1.30c. to 1.32½c., mill, is quoted by some sellers, dependent on specifications, others are maintaining

1.35c., minimum, and further advances are considered. For delivery in this vicinity refined iron bars are quoted at 1.37½c. to 1.45c., delivered. Steel bars are fairly active, at 1.55c., delivered here.

Coke.—Negotiations are still pending for furnace coke for forward delivery, as buyers and sellers have not yet been able to agree on prices. For early delivery, however, business has been done at prices ranging from \$1.65 to \$1.75, at oven, although for extended delivery from \$1.85 to \$2 is named. A moderate business in foundry coke has been done at prices ranging from \$2.20 to \$2.50 at oven, dependent on brand and delivery. The following range of quotations, per net ton, is named for deliveries in this vicinity:

Connellsville furnace coke.	\$3.90 to \$4.25
Foundry coke.	4.40 to 4.65
Mountain furnace coke.	3.50 to 3.85
Foundry coke.	4.00 to 4.25

Old Material.—Conditions are practically unchanged, buying being quiet, awaiting awards against bids for railroad scrap. It is said that at least close to the top of the market has been bid for various grades of material offered by railroads in this district. Small lot buying in No. 1 heavy melting steel scrap is reported at \$14.25, delivered Eastern mill, although some buyers do not offer over \$14, delivered, for this grade. Rolling mill scrap is firm, but the business transacted has been small. Notwithstanding the inactivity, the tone of the market is strong and prices are firm at the following range, for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 35c. to \$1.35 per gross ton.

No. 1 heavy melting steel scrap.	\$14.00 to \$14.50
Old steel rails, rerolling.	15.50 to 16.00
Low phosphorus heavy melting steel scrap.	18.50 to 19.00
Old steel axles.	21.00 to 21.50
Old iron axles.	26.00 to 27.00*
Old iron rails.	18.50 to 19.00
Old car wheels.	14.00 to 14.50
No. 1 railroad wrought.	17.50 to 18.00
Wrought iron pipe.	14.00 to 14.50
No. 1 forge fire.	12.25 to 12.75
No. 2 light iron.	8.00 to 8.50*
Wrought turnings.	10.25 to 10.75
Cast borings.	10.00 to 10.50
Machinery cast.	14.50 to 15.00
Railroad malleable.	12.50 to 13.00*
Grate bars.	12.00 to 12.50
Stove plate.	11.50 to 12.00

* Nominal.

The Princess Furnace Company is preparing to blow in its furnace at Glen Wilton, Va., this week. It has been undergoing extensive repairs.

St. Louis

St. Louis, March 13, 1911.

In the main, a conservative if not a cautious spirit is indicative of the attitude of buyers of most heavy material and there is little if any disposition to speculate for a rise. On the other hand, in pig iron at least, there are no signs of short selling. In coke, the low prices are attracting purchasers. Old material is easier in the absence of demand from consumers. The indications for freer buying on the part of railroads are improving, especially with respect to standard rails.

Pig Iron.—A lull in the demand for pig iron was experienced by the leading sellers during the past week, but merchant houses reported that their salesmen were meeting with satisfactory success among the small buyers in St. Louis territory. The largest transaction mentioned was the sale of 6000 tons of Northern basic to an east side steel foundry. One of the principal agencies reported the sale of 1500 tons of 6 per cent. silicon, and 500 tons of Southern No. 2 foundry, both for future delivery. The representative of a leading Southern interest, in the past ten days, has placed 2700 tons of Southern No. 2 foundry, principally. Scattering sales of lots of 100 to 500 tons have also been made by the leading officers. The inquiry is now mainly for last half delivery. Special inducements are offered for iron for prompt shipment, on a cash basis, without takers. We quote the market unchanged and steady to firm at \$11. Birmingham, for Southern No. 2 for shipment over the remainder of the first half and including third quarter and \$11.50 for fourth quarter only, with the notation that some furnaces are holding at higher figures. Northern No. 2 foundry is quoted at \$14 to \$14.50 Iron-ton.

Coke.—The developments in coke the past week indicate that some large interests are in the market, since we note the following inquiries: One for 4000 tons of foundry coke for shipment over the remainder of the year; one for 2400 tons of furnace coke and another inquiry for 12 cars of foundry coke. The sale of 1000 tons of foundry coke for future delivery is reported. Merchant sellers also report doing a fair carload business. The low prices at which coke has

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been offered of late are bringing some large consumers into the market and, while there is no advance, the tendency is stronger. We quote for 72-hour Connellsville foundry, for shipment over the remainder of the year, \$2.15 to \$2.25 per net ton at oven. Special brands and carload lots are held 25c. to 50c. per ton higher.

Finished Iron and Steel.—The leading interest reports closing a contract with a Kansas railroad for 2200 tons of standard rails. Lumbermen are making better inquiry for light rails. In structural material there is a steady but moderate demand. Bars are holding a fair average demand, with some improvement in orders from jobbers as the spring season draws nearer. There is a fair inquiry for track material, and the outlook for railroad business is better, particularly on rails.

Old Material.—The market for scrap iron and steel has weakened under a let-up in the demand from consumers, and most of the business that is passing is between dealers and filling specifications on previous contracts. The following offerings by railroads are reported: Mobile & Ohio, 400 to 500 tons; Southern, 500 tons. Prices on most of the list are about 50c. per ton lower. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$14.00 to \$14.50
Old steel rails, re-rolling.....	13.50 to 14.00
Old steel rails, less than 3 ft.....	12.50 to 13.00
Relaying rails, standard sections, subject to inspection.....	23.50 to 24.00
Old car wheels.....	13.00 to 13.50
Heavy melting steel scrap.....	12.00 to 12.50
Frogs, switches and guards, cut apart.....	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates.....	\$11.50 to \$12.00
Iron car axles.....	18.50 to 19.00
Steel car axles.....	18.00 to 18.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	11.00 to 11.50
Railway springs.....	10.50 to 11.00
Locomotive tires, smooth.....	16.50 to 17.00
No. 1 dealers' forge.....	9.50 to 10.00
Mixed borings.....	5.00 to 5.50
No. 1 bushing.....	10.00 to 10.50
No. 1 boilers, cut to sheets and rings.....	8.50 to 9.00
No. 1 cast scrap.....	12.00 to 12.50
Stove plate and light cast scrap.....	9.50 to 10.00
Railroad malleable.....	9.50 to 10.00
Agricultural malleable.....	9.00 to 9.50
Pipes and flues.....	8.50 to 9.00
Railroad sheet and tank scrap.....	8.50 to 9.00
Railroad grate bars.....	9.00 to 9.50
Machine shop turnings.....	7.50 to 8.00

Matthew Addy & Co., St. Louis, have been appointed selling agents for the Pittsburg & Ohio Mining Company, miner and shipper of Pando smithing coal.

Birmingham

BIRMINGHAM, ALA., March 13, 1911.

Pig Iron.—With the exception of one or more small lots of low grade iron for spot shipment, the sales in this market the past week were not at a higher price than the basis of \$11, Birmingham, for No. 2 foundry, but none of the transactions recorded involves deliveries after July 1. The largest single transaction reported covered 2500 tons of No. 3 for shipment in May and June, while 1500 tons of No. 4 was sold for delivery as produced. The local office of a leading interest reports aggregate sales of 1250 tons for shipment during the remainder of the first half, and 6500 tons for practically the same delivery was reported through their Northern and Eastern agencies. Such small lots of gray forge and mottled as were available were readily disposed of on the basis of \$11.50 for spot shipments of No. 2. An inquiry for 2500 tons of gray forge for shipment within the next ninety days was received at local offices, but no report has yet been made of the quotations submitted. An offer of \$11 for 7500 tons of Nos. 2 and 3 foundry for shipment through the remainder of this year was recently refused, and a basis of \$11.50 is known to have been the lowest quoted on lots of 5000, 3000 and 2500 tons each for shipment in the last half. There seems no doubt that the \$11.50 basis is firm for strictly last half deliveries and for the third quarter where the tonnage offered is comparatively small, but there is a possibility that second quarter shipments could be made to extend into the third quarter at the \$11 price. The actual reduction in furnace stocks the month of February was approximately 33,000 tons.

Cast Iron Pipe.—The tonnage placed since last report consists principally of comparatively small lots but the prices received indicate the maintenance of the recent advance. Of course, in the absence of a criterion, it is not claimed that the higher asking prices have become effective for the large contracts, but it is known that the competition for large tonnages would not be keen even at the prices that are now being asked. No new lettings have been added to those that are to come up within a short time, but inquiries are

being received in quite a significant volume. We consider the market as a whole stronger than for some weeks and quote prices firmly at the following, for water pipe, per net ton, f.o.b. cars here: 4 to 6 in., \$22; 8 to 12 in., \$20; over 12 in., average \$19, with \$1 per ton extra for gas pipe.

Old Material.—This market is quiet and probably less was moved the past week than in the week previous. This is considered largely due to the falling off in the demand from local consumers; however, the inquiry from other quarters of the trade has not been equal to expectations. There is no reason to believe that prices are weaker, but the condition existing is such that all quotations are considered nominal. We quote as follows, per gross ton, f.o.b. cars here:

Old iron axles.....	\$14.00 to \$14.50
Old iron rails.....	12.50 to 13.00
Old steel axles.....	12.50 to 13.00
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	9.50 to 10.00
No. 1 country wrought.....	8.00 to 8.50
No. 2 country wrought.....	7.50 to 8.00
No. 1 machinery.....	10.00 to 10.50
No. 1 steel.....	9.50 to 10.00
Tram car wheels.....	9.00 to 9.50
Standard car wheels.....	10.50 to 11.00
Light cast and stove plate.....	8.00 to 8.50

Cleveland

CLEVELAND, OHIO, March 14, 1911.

Iron Ore.—Local ore firms are not looking for much demand for Lake Superior ores from Eastern furnace interests, although sales in the East would doubtless be stimulated considerable if a reduction of 50c. a ton should be decided upon. Shipments to the East were light last year. Foreign ores are now being delivered at the Atlantic seaboard at about the same prices as a year ago, so that there is little change in the Eastern situation as regards competition of foreign ores. There is no indication of any activity in the Lake Superior ore market in the near future, and ore firms are still deferring the consideration of the price question. We quote prices as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

Pig Iron.—A moderate volume of business in small lots is coming out, largely for foundry iron for the second quarter, and there is an increasing number of inquiries for the last half. Many of the latter, however, are market feelers and are not resulting in the placing of orders. The largest inquiry was from the Best Foundry Company, Bedford, Ohio, for 5000 tons, for the last half. Of this, 1500 tons of Ohio 6 per cent. silicon has been purchased at \$17, delivered. The remainder, half No. 2 Northern and half Southern, will probably be contracted for within a day or two. The Northern inquiry brought out a price of about \$14, at furnace, for the last half, which is the general quotation for the second quarter. Most of the furnace interests are still asking \$14.50 for No. 2 foundry for the last half, but one Valley producer is now understood to be making a quotation of \$14.25 for that delivery. The Bedford inquiry is the first one of any size to test the last half market in this territory, but in view of the firmness of most sellers the price quoted does not appear to fairly represent the market at the present time. A number of producers feel that if last season's ore prices are re-established this year they will have no trouble in holding up last half prices at an advance of 50c. a ton over the second quarter. We note the sale of 1000 tons of malleable and 900 tons of No. 2 Southern. The latter went to a northern Ohio foundry, 500 tons being for the second quarter, at \$11, Birmingham, and 400 tons for the third quarter, at \$11.50, the latter price being about 25c. a ton above the usual quotation for that delivery. For prompt shipment and the second quarter we quote, delivered, Cleveland, as follows:

Bessemer.....	\$15.90
Northern foundry, No. 1.....	14.50
Northern foundry, No. 2.....	\$14.00 to 14.25
Northern foundry, No. 3.....	13.75 to 14.00
Gray forge.....	13.50 to 14.00
Southern foundry, No. 2.....	15.35
Jackson Co. silvery, 8 per cent. silicon.....	18.00

Coke.—A northern Ohio furnace interest has bought 2000 tons of furnace coke for March delivery at \$1.60 per net ton, at oven. With this exception there is no activity in furnace grades, on which prices continue firm. The foundry coke market is quiet, about the only sales reported being in carload lots. We quote standard Connellsville furnace coke at \$1.55 to \$1.60 per net ton, at oven, for spot shipment; \$1.65 for the second quarter and \$1.75 to \$1.90 for the last half. Connellsville 72-hour foundry coke is held at \$2 to \$2.15 for spot shipment and \$2.25 to \$2.50 for the remainder of the year.

Finished Iron and Steel.—The demand in finished lines

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is holding up at about the same volume as for the past two or three weeks. Mills are getting a fair number of small orders, and specifications are very satisfactory. More liberal orders on contracts are coming from the bolt and nut manufacturers than for some time. No large inquiries are coming out, but the general situation is regarded as quite satisfactory. In structural lines there is considerable improvement in the prospect for a good volume of business in the near future. Several railroads are considering the placing of orders for considerable tonnage for bridge construction. The Pere Marquette Railroad now has plans out for estimates on a number of bridges. The new city hall in Cleveland will require 2000 tons of steel. Bids for the superstructure of this building will be received about May 15. A number of inquiries are pending for lots ranging from 200 to 300 tons. Prices on steel bars, plates and structural material are firm at 1.40c., Pittsburgh. The demand for sheets is holding up nicely and regular prices are being well maintained. The demand for iron bars is only fair, but prices seem to be slightly firmer. We quote iron bars at 1.30c. to 1.35c., at mill. Jobbers report a good volume of warehouse orders.

Old Material.—The scrap market has been very dull. Prices have weakened, and buyers are offering about 50c. a ton less on all grades than a week ago. Dealers decline to change recent quotations, with the exception of heavy melting steel, because of the absence of transactions to establish prices, but it is admitted that present quotations are largely nominal. Some of the mills are ordering the holding back of shipments of scrap recently bought, and there is practically no new demand. Dealers appear willing to wait for a better market, and little scrap is being offered from yard stocks. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$14.00 to \$14.50
Old iron rails.....	17.00 to 17.50
Steel car axles.....	19.50 to 20.00
Heavy melting steel.....	12.75 to 13.00
Old car wheels.....	13.00 to 13.50
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	12.00 to 12.50
Railroad malleable.....	13.00 to 13.50
Light bundled sheet scrap.....	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.00 to \$21.50
Cast borings.....	7.00 to 7.50
Iron and steel turnings and drillings.....	7.50 to 8.00
Steel axle turnings.....	9.00 to 9.25
No. 1 bushing.....	11.50 to 12.00
No. 1 railroad wrought.....	13.00 to 13.25
No. 1 cast.....	12.00 to 12.50
Stove plate.....	11.00 to 11.25
Bundled tin scrap.....	11.00 to 11.50

The Ohio Iron & Metal Company, an important dealer in iron and steel scrap, with main offices in Chicago and branch offices in Pittsburgh and New York, has also opened a branch office in Cleveland, in suite 803 Citizens Building in charge of Armand Alexandre.

Cincinnati

CINCINNATI, OHIO, March 15, 1911.

Pig Iron.—Prices are well settled and maintained up to July 1 at \$11, Birmingham, for Southern No. 2 foundry, and \$14, Ironton, for Northern, but after that date there are numerous rumors afloat regarding the correct quotable figures. It is understood that several Southern furnaces are willing to take on business extending through the third quarter at \$11 to \$11.25, but for the last half they are generally asking \$11.50. Northern producers are quoting \$14.50 for any shipment beyond June, but sales have been made below this, among which were 300 tons for a southern Ohio manufacturer and 500 tons going to Indiana, both booked at \$14 for third quarter delivery. Furnace coke producers are stiffening prices, and, as there does not appear to be any chance for cheaper ore, Northern furnaces may be compelled to carry out their long-announced intention of advancing the present market price. Included in sales of Southern iron are 500 tons of No. 1 soft to an Illinois melter, March to July delivery, inclusive; 800 tons to a northern Ohio consumer, May to September shipment; 500 tons of No. 3 to a Wisconsin manufacturer and numerous small lots of No. 2 foundry. The low grades are still scarce, but a southern Ohio firm bought 1000 tons of No. 4 foundry at \$10.25, Birmingham, for immediate shipment and 500 tons was contracted for by a Southern manufacturer for extended delivery. A central Ohio stovemaker purchased 2000 tons of Southern No. 2 foundry and 1000 tons of Ohio silvery shipments extended through the last half. Very few large inquiries are being figured on. A northern Ohio melter is asking for 3000 to 4000 tons of Northern and about 2000 tons of Southern foundry for last half shipment. Indiana furnishes several inquiries on small lots, and there

are a few requests for prices on foundry iron from nearby consumers. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry.....	\$14.75
Southern coke, No. 2 foundry.....	14.25
Southern coke, No. 3 foundry.....	13.75
Southern coke, No. 4 foundry.....	13.50
Southern coke, No. 1 soft.....	14.75
Southern coke, No. 2 soft.....	14.25
Southern gray forge.....	13.00
Ohio silvery, 8 per cent. silicon.....	17.70
Lake Superior coke, No. 1.....	15.70
Lake Superior coke, No. 2.....	15.20
Lake Superior coke, No. 3.....	14.70
Standard Southern car wheel.....	25.25
Lake Superior car wheel.....	19.50

(By Mail.)

Coke.—Inquiries from three to four consumers for a year's supply of foundry coke have been received lately. The amounts range from 20 to 100 carloads. There is no activity in furnace coke, but in the face of this there is some talk of stiffening prices. In the Connellsville, Pocahontas and Wise County fields furnace coke is quoted around \$1.00 for prompt shipment and \$1.65 to \$1.75, per net ton, at oven, on contracts. Foundry coke remains around \$2 for spot shipment, with \$2.25 asked for future delivery.

Finished Material.—Reinforcing concrete bars are moving better than for some time. Structural material also continues to show signs of improvement, but plates remain rather slow. Railroad track spikes and bolts appear to be holding their own, and the demand is an improvement over that of three months ago. The mill price on structural material and steel bars is 1.40c. and the local warehouse price 1.80c. to 1.95c.

Old Material.—Offerings of scrap are said to be lighter, and the demand from consumers is also slack. No change in prices is contemplated for the near future, although should there be any marked improvement in the pig iron situation it would be quickly reflected in the old material market. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton.....	\$12.00 to \$12.50
Cast borings, net ton.....	5.00 to 5.50
Steel turnings, net ton.....	6.00 to 6.50
No. 1 cast scrap, net ton.....	11.00 to 11.50
Burnt scrap, net ton.....	8.00 to 9.00
Old iron axles, net ton.....	17.50 to 18.50
Bundled sheet scrap, gross ton.....	8.50 to 9.00
Old iron rails, gross ton.....	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton.....	21.50 to 22.50
Old car wheels, gross ton.....	12.00 to 12.50
Heavy melting steel scrap, gross ton.....	11.00 to 11.50

J. K. Dimmick & Co., Philadelphia, Pa., have opened a branch sales office at 810 Union Trust Building, Cincinnati, with Charles E. Pool as manager. The firm has recently taken over several New River and Pocahontas coal companies, and Mr. Pool will look after all of its Western trade on Pocahontas and New River coal and coke. In addition to this coal, he will attend to the pig iron and coke trade in the immediate vicinity of Cincinnati.

San Francisco

SAN FRANCISCO, March 8, 1911.

Business this week has been hampered by a heavy storm, which has delayed both rail and coastwise traffic, and caused extensive damage to railroad equipment, bridges, &c., in various parts of the State. The improvement expected at the beginning of March has not materialized, the tonnage in most departments being smaller than for the latter part of February. The curtailment of demand, however, is attributed entirely to temporary conditions, and a few weeks of fair weather should bring out a general buying movement. The majority of consuming industries are making liberal estimates of their requirements for the summer. Inquiries are beginning to come from the mining and oil interests, and there is an immediate prospect of business from numerous development projects.

Bars.—The distributive movement of soft steel bars is quiet at the moment, but the requirements of the small trade are certain to increase materially this month. Business is gradually coming out from the larger manufacturing interests, though most of the buying covers only requirements of the near future. Merchants are amply supplied for the business in sight, and are buying only in a small way. Several of them are holding off pending a further demonstration of the Western Steel Corporation's ability to establish a place in the market. This concern has already sold considerable material in this city, but its position is still somewhat uncertain. Jobbing prices are unchanged, but there is a firmer feeling, and any material increase in demand would probably cause an advance. A

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few substantial orders have been booked for reinforcing material, but no general demand is expected until the weather clears. Bars from store, San Francisco, are quoted at 2c. for both iron and steel.

Wire and Wire Products.—Jobbing and resale prices were advanced \$1 per ton this week, in sympathy with Eastern conditions, and a rising market has brought out a substantial volume of new business. Merchants are placing liberal orders for nails and fence wire of all descriptions, and the resumption of logging operations throughout the Coast district is bringing out an increased demand for wire rope.

Structural Material.—Local building operations decreased somewhat in February, the valuation of buildings for which permits were issued being \$1,455,824, compared with \$1,617,908 for January and \$1,780,230 for February, 1910. The decrease is the natural result of weather conditions, which have made active operations almost impossible. A fair number of fabricating contracts have come out, however, and figures are to be taken before the end of the month on a substantial amount of new work. Any material improvement due to the Panama-Pacific Exposition will be delayed until the site for this event is selected and definite work started on the plans. The Pacific Rolling Mill Company has taken a fair order for the temporary City Hall, and has signed the contract for the Lowell High School. The Northwest Steel Company will fabricate about 250 tons for the Multnomah Athletic Club, Portland, Ore. Bids on the Multnomah County court house have been rejected. Locally, figures are being taken on a small job for the Children's Hospital, and the city will soon be in the market for the Girls' and Polytechnic high schools. Figures are also to be taken within 10 days on 700 tons for the St. Joseph's Orphanage, about 100 tons for the St. Dominic's Church, and the new plans for the Knights of Columbus Building. Bids will also be taken soon on the Van Nux Building in Los Angeles. The Washington Portland Cement Company is in the market for about 500 tons for a cement mill near Seattle. Specifications of the Oakland City Hall are being published in book form, and will be out about the end of the month. General contracts have been let on the Chester building, and the Union Oil Company's building at Los Angeles, and the Odd Fellows of that city are planning a large structure. Designs are being drawn for a large steel bridge for Tacoma, Wash. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.65c.

Rails.—The tonnage actually ordered since the first of the month is comparatively light, but the inquiry is increasing, and while no immediate result is expected from many of the inquiries the outlook is considered good. Several operating concerns in California are coming into the market, and there is a steady run of small orders from the timber districts of Oregon and Washington. Mining companies in the mountain district are just beginning to take an interest in light rails, but more business than usual is expected from this quarter during the early summer.

Sheets.—The distributive movement is comparatively light, but a general demand for black and galvanized sheets is expected in the next two months, and merchants are buying quite freely. The tin plate requirements of the salmon and fruit canning industries on the Pacific Coast will be exceptionally large this year.

Plates.—There has been considerable activity in a jobbing way, and a few fairly large inquiries are in the market. Considerable small boiler work is being done locally, but the principal requirements are for oil and gas tanks and riveted pipe.

Merchant Pipe.—The movement of small pipe through the country has been very small this month, due principally to weather conditions. There is some inquiry, however, and a strong demand is expected from now on, though merchants are very conservative in placing orders for stock. Considerable business has been booked in connection with water works and gas systems, but the individual orders are small. While immediate delivery to the oil fields is attended with some difficulty, there are indications of a revival in that quarter. Small inquiries for casing and line pipe for spring delivery are increasing, and a fairly large tonnage has been ordered by the Kern Trading & Oil Company.

Cast Iron Pipe.—Prices show increasing firmness, and in expectation of a further advance a large volume of business has been booked in the past two weeks. Small municipal projects are doing most of the buying, though a very fair tonnage has been taken by private corporations in all the coast States. The Los Angeles Gas & Electric Company has just taken bids on 2000 tons of 8, 10, 12 and 30 in. pipe. Bids will be taken March 13 for a lot of pipe for Porterville, Cal., and 248 tons for Los Angeles, and the town of Kingsburg, Cal., will open bids March 15 for a complete water works system. Prices at Pacific Coast

terminal points are \$3 for 6 in. to 12 in. and \$35 for 4-in. pipe, per net ton.

Pig Iron.—The local foundry trade remains quiet, and there is less demand from the north coast than for some time. A cargo of 900 tons of English iron has just arrived here. Spot supplies are fairly large, and it is difficult to sell anything to arrive. The tonnage of foreign iron in transit is lighter than usual. Most of the steel plants on the coast are using Chinese iron, but the foundry trade is buying Southern iron to a larger extent than usual. English, Continental and Chinese foundry iron is quoted at \$23, with occasional sales at lower figures. No. 2 Southern foundry iron, f.o.b. San Francisco, is held at \$21 to \$22.

Old Material.—Cast iron scrap is rather closely cleaned up, and a lively demand fails to bring out any large offerings. Very little business has recently materialized on steel melting scrap, though a number of substantial inquiries are still in the market. The most important transaction is a contract for 120,000 tons, to be delivered in five years to the Western Steel Corporation by M. Brade & Son, Portland, Ore. Quotations are unchanged, as follows: Cast iron scrap, per net ton, \$18; steel melting scrap, per gross ton, \$12.50; wrought scrap, per net ton, \$12 to \$15; re-rolling rails, per net ton, \$15.

The Colorado Fuel & Iron Company, Denver, Colo., is placing on the market a new line of wire field fence, for which the San Francisco office is now taking orders.

The German Iron Market

BERLIN, March 2, 1911.

The conference of the bar producers last week finally adjourned without any tangible result, and a further meeting is to be held March 7 to make another effort toward completing the organization. The prospects for reaching such a result, however, look unpromising. The Hoersch Company, one of the largest producers of bars, finally took a very strong position against fixing any specific prices, and it is reported that the Gutehoffnungshütte, another very important concern, also refuses to be brought into line. On the other hand, an understanding with the open hearth mills was reached at a moment when all hopes of such a result had been about given up.

It is now admitted freely that the existing price convention has latterly sunk into a mere nominal affair. As a matter of fact, bar prices now average around 105 and 106 marks, and even as low as 100 marks is mentioned as occurring in extreme cases; whereas the nominal price of the convention is 112 to 114 marks. The export price is about 95 marks aboard ship at Antwerp. At these low prices there is a very heavy demand both from the home and the foreign market; and specifications on orders goods are coming in with some urgency. If the convention breaks up it is regarded as probable that prices will go even somewhat lower.

This whole controversy over bars gives a foretaste of the difficulties that will confront the big Steel Works Union within a few months when it undertakes to secure its prolongation. Most of the large companies belonging to it have been developing their establishments in various ways. Many have been adding plants for producing special lines of finished products, or annexing existing independent mills of this kind. Some of the outside mills, too, have built open hearth steel plants of their own in order to render themselves independent of the Union. The great establishments of varied production will be in a position to put forward demands for increased allotments. Moreover, it is generally regarded as necessary that the full syndication of the B class of products—that is, all forms of steel except semi-finished steel, rails and ties and structural shapes—be undertaken along with the renewal of the Union; that is to say, it will be necessary, not only to assign allotments in the B products, but to fix prices also, besides having all sales made through the Union. That is the goal which the great steel works have before their eyes; but there are such obstacles in the way of reaching it that it already seems probable that the Union will go to pieces in the attempt to harmonize all interests.

The market situation has barely changed since a week ago, and little can be said about it; but the tendency seems to be somewhat better in certain directions. The news from the Belgian market continues favorable.

A report on the state of business in the hardware trade indicates that manufacturers are pretty well satisfied with orders and with the outlook. In the cutlery trade at Solingen, manufacturers are satisfied with business, but work is considerably disturbed through labor troubles. Prices there are fairly satisfactory. The tool manufacturers at Remscheid and the adjacent country are planning a general

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advance in prices this spring. The demand for tools is quite active; the iron works, machine shops, and similar establishments are sending in good orders, and the foreign market is buying heavily of certain specialties. The makers of screws, after having organized themselves, have been able to enforce better prices. The manufacturers of wire nails complain of unsatisfactory business. The automobile and bicycle industries are in excellent shape.

Buffalo

BUFFALO, N. Y., March 14, 1911.

Pig Iron.—Underlying conditions appear to be strengthening, with a decrease in stocks on furnace banks and a continued tendency toward a rise in prices. A number of transactions involving fairly good tonnages have been closed, one interest having taken an order for 10,000 tons, comprised of basic and malleable, from a manufacturer of railroad supplies, which was reported last week as under negotiation. Inquiries for 25,000 to 30,000 tons of foundry and malleable from agricultural implement makers, mentioned in last report, are still under negotiation, a portion being for extended deliveries. Prices are held stiffly at current price schedules and there is an increasing disposition among producers to decline to make contracts for forward delivery on the basis of first half schedules. The Lackawanna Steel Company now has five of its seven furnaces in blast. We quote as follows, f.o.b. Buffalo, for prompt and second quarter delivery:

No. 1 X foundry.....	\$14.75 to \$15.00
No. 2 X foundry.....	14.50 to 14.75
No. 2 plain.....	14.00 to 14.50
No. 3 foundry.....	14.00 to 14.25
Gray forge.....	13.75 to 14.00
Malleable.....	14.50 to 15.00
Basic.....	14.50 to 15.00
Charcoal.....	17.00 to 17.50

Old Material.—The market has not been quite as active as in the preceding week. Although no large blocks of material are pressing the market, some few lots of scrap are being sold at prices approximately represented by the schedule shown below. Dealers, however, are not inclined to dispose of their stocks on the basis of the prevailing market prices, for the reason that the current supply of scrap is very limited and any increase in demand would have a tendency to strengthen the market. Shipments moving on contracts are going into actual consumption, which would indicate that any new finished business placed would create further buying of scrap. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$13.75 to \$14.25
Low phosphorus steel.....	18.00 to 18.50
No. 1 railroad wrought.....	15.75 to 16.25
No. 1 railroad and machinery cast scrap..	14.75 to 15.25
Old steel axles.....	20.50 to 21.50
Old iron axles.....	24.00 to 25.00
Old car wheels.....	14.75 to 15.00
Railroad malleable.....	14.25 to 14.75
Boiler plate.....	11.75 to 12.25
Locomotive grate bars.....	11.75 to 12.25
Pipe.....	11.25 to 11.75
Wrought iron and soft steel turnings..	7.50 to 8.00
Clean cast borings.....	7.00 to 7.25

Finished Iron and Steel.—Most of the selling agencies report that orders coming in show an increase in number and tonnage for nearly all lines of finished products; specifications on contracts continue in good volume, and prices in all lines are holding firm. The local agency of the leading interest has closed contract for a good-sized tonnage of steel bars, and states that orders both currently and on contracts have been extremely heavy during the week, orders for Canadian export being particularly good. Tenders are out for 1500 tons of steel rails for electric traction lines at Toronto. In structural shapes a considerable increase in activity is in evidence. An order for 100 tons of sheet piling has been taken by the Jones & Laughlin Steel Company for completion of bridge abutment construction on the Rochester, Syracuse & Eastern Railroad. The Lane Bridge Company, Painted Post, N. Y., has secured contract for 170 tons for the three-span highway bridge over Rondout Creek, at Kingston, N. Y. Plans are soon to be out for the construction of two double track railroad bridges for the New York Central, one over the Oswego River, at Oswego, and the other over the Black River, at Watertown, N. Y. The Lackawanna Bridge Company has received the contract for fabrication and erection of the Eleventh street viaduct over the New York Central tracks at Niagara Falls, about 200 tons. Specifications are to be figured this week for 1500 tons of bridge work for the Western division of the Grand Trunk Railroad between Port Huron and Chicago. Bids are being advertised for this week for the Hutchinson High School, Buffalo, which will require about 800 tons. Bids are also being received this week for additions to the manufacturing plants of the Frontier Iron Works, Buffalo, and Buffalo Bolt Company and Niagara Radiator & Boiler Company, North

Tonawanda, each of which will require approximately 100 tons. The A. Fredericks & Son Company, Rochester, has received the contract for the Eastman Kodak Company's factory building No. 42, and has placed an order for the steel concrete reinforcing bars required, aggregating 250 tons.

Construction work on the new bar mill of the Lackawanna Steel Company, Buffalo, is making good progress, and it is expected that the mill will be equipped and ready for operation in July. Its completion will enable the company to produce a greater diversity of lighter weight products, such as flats and bands.

New York

NEW YORK, March 15, 1911.

Pig Iron.—The tone of the market is somewhat improved, but the volume of business expands slowly. Transactions of the past week have been largely with foundries in New England and in New York State, chiefly in the former district. One Connecticut foundry bought about 1000 tons of foundry grades. Another Connecticut buyer took 1000 tons of high phosphorus iron and about 2000 tons of other grades, chiefly No. 2 plain iron, deliveries running well toward the end of the year. Eastern Pennsylvania furnaces have been able to get about 50 cents a ton more on recent sales than the basis reached in the low prices of early February. Sales are now being made for the second quarter, the third quarter and the second half. For these later deliveries advances are secured, but as a rule the asking prices of furnaces for the second half are more than the average buyer expects to pay, and business of this sort is closed only after considerable negotiation. It is understood that from \$14.50 to \$15, Buffalo, is the range on business carrying deliveries as late as October, one transaction involving deliveries from July to October being on a basis of \$15, Buffalo. Considerably lower prices, however, are made for the second quarter. A New Jersey pipe foundry is in the market for 1000 to 1500 tons of second quarter iron running 1.25 to 1.75 per cent. in silicon. A sale of 1000 tons of foundry iron is reported, an Eastern buyer taking the iron for one of its plants located in the Middle West. For tidewater delivery in the second quarter we quote as follows: Northern No. 1 foundry, \$15.75 to \$16; No. 2 X, \$15.50 to \$15.75; No. 2 plain, \$15.25 to \$15.50; Southern No. 1 foundry, \$15.50 to \$16; No. 2, \$15 to \$15.25.

Finished Iron and Steel.—While little is to be judged from a week by week comparison, it is believed that the slight improvement last week over the previous week presages increasingly better conditions throughout the spring at least. No really marked activity, however, is looked for until the railroads come more prominently into the market, and there is no immediate prospect of that. The local demand for plates is greater, as the tank and ship repair shops are somewhat busier. Interest turns again to the battleship No. 35, authorized by Congress last year and which was to be built at the Brooklyn Navy Yard but was held up when the lowest bids for materials exceeded the appropriation. Congress on the day of adjournment of the last session passed an amendment increasing the appropriation, and the vessel will be built by the Government according to the original plans. Contracts for the materials are expected to be placed shortly. Steel bars are quiet but mills are receiving fair specifications, and replace orders are looked for in the near future. Bar iron orders have fallen off a little in volume in the past week, but the recent advance of price seems to be well maintained. The structural interests would be quite well content for a season if the numerous deferred matters were placed. It is anticipated that two or three of the larger ones will be closed within the next week or two. One of these is the post office at the Pennsylvania terminal in this city, the general contract for which has at last been awarded the George A. Fuller Company. About 6400 tons of steel will be required. The same company will have 3700 tons of steel to give out for the Masonic Temple, bids on which closed yesterday. The New England Structural Company has the general contract for the Plaza Hotel to be erected on Copley Square, Boston, and the steel, 2500 tons, will be furnished by the American Bridge Company. The latter also has 400 tons in two bridges for the Boston & Maine, and the Pennsylvania Steel Company a bridge of 100 tons for the same road. Levering & Garrigues have 1500 tons for the Forbes & Wallace store in Springfield, Mass., and 600 tons for the Southern New England Telephone Company building at Hartford, Conn. Bethlehem shapes will be used in the last named job and possibly in both to a large extent. Hamilton & Chambers have given the steel for the Kirkman soap factory, Brooklyn, 200 tons, to the Eastern Steel Company. The New Haven is in the market for a small highway bridge at Randolph, Mass. Snare & Triest were low bidders as general contractors for

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the improvements to the Queensboro Bridge, which will require 600 tons. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.40c. to 1.45c., all New York. Store prices for plain material and plates, New York, are 1.85c. to 1.95c.

Steel Rails.—The Chicago & Northwestern, which recently ordered 40,000 tons for this year, has just increased that amount by 5000 tons. The Carnegie Steel Company has sold 3000 tons to the Ocala Northern in Florida. Two other Southern orders are 625 tons for Stone & Webster, to be delivered at Houston, Texas, placed with the Maryland Steel Company, and 1030 tons for the Vicksburg Shreveport & Pacific, to be rolled by the Tennessee Coal, Iron & Railroad Company. The Canadian Pacific is inquiring for 25,000 tons in this country. The Harriman order is considered practically closed, but no announcement has been made.

Ferroalloys.—Very little ferrosilicon is being asked for and prices seem to be advancing on foreign grades. Considering the price asked abroad, ferrosilicon cannot be imported here from Europe now for less than \$59, Pittsburgh, but is being offered at around \$55, Pittsburgh. Ferromanganese is very quiet, with quotations \$37.50 to \$38, Baltimore.

Cast Iron Pipe.—The city of Boston opened bids on Tuesday on 2800 tons of water pipe. Waltham, Mass., opens bids to-day on 125 tons; Medford, Mass., 130 tons, March 20; Westbury, N. Y., 630 tons, March 20; Lewiston, Mont., 1100 tons, March 24. The general market shows a renewal of activity, with quite a number of inquiries from private consumers and some sales. Competition for business is still keen. Carload lots of 6 in. are quoted at \$21 to \$22 per net ton, tidewater.

Old Material.—The railroad companies have fared much better than dealers in disposing of their old material. The railroad lists this month were closed at quite satisfactory prices, largely to dealers. The demand from consumers is slow. Offerings by dealers have met with very little response. Heavy melting steel scrap is especially quiet. Rolling mill grades are only moving in small lots. It is worthy of remark that wrought turnings have parted company with cast iron borings, now selling at about the usual difference instead of at the same price as has recently been the case. Foundries are not doing much buying at present. A special demand for locomotive grate bars has slightly advanced their price. The general tendency of the market appears to be toward lower prices. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting.....	\$11.25 to \$11.75
Heavy melting steel scrap.....	11.25 to 11.75
Relaying rails.....	20.50 to 21.00
Standard hammered iron car axles.....	23.00 to 23.50
Old steel car axles.....	16.50 to 17.00
No. 1 railroad wrought.....	14.00 to 14.50
Wrought iron track scrap.....	13.00 to 13.50
No. 1 yard wrought, long.....	13.00 to 13.50
No. 1 yard wrought, short.....	12.00 to 12.50
Light iron.....	5.00 to 5.50
Cast borings.....	6.50 to 7.00
Wrought turnings.....	7.50 to 8.00
Wrought pipe.....	11.00 to 11.50
Old car wheels.....	12.50 to 13.00
No. 1 heavy cast, broken up.....	12.50 to 13.00
Stove plate.....	9.50 to 10.00
Locomotive grate bars.....	10.00 to 10.50
Malleable cast.....	11.50 to 12.00

Metal Market

NEW YORK, March 15, 1911.

THE WEEK'S PRICES

Cents Per Pound for Early Delivery.							
Copper, New York.			Lead.		Spelter.		
March.	Lake.	Electro.	Tin.	New York.	St. Louis.	New York.	St. Louis.
9.....	12.75	12.25		40.35	4.40	4.25	5.65
10.....	12.75	12.25		39.70	4.40	4.25	5.65
11.....	12.50	12.25		40.00	4.37½	4.22½	5.65
12.....	12.50	12.25		40.25	4.37½	4.22½	5.65
13.....	12.50	12.25		40.00	4.37½	4.22½	5.65
14.....	12.50	12.25		39.75	4.37½	4.22½	5.65

Arrivals of tin in American ports were unusually large for the first half of the month, but the scarcity of spot supplies continues, as there is a heavy demand. Lake copper is ¼c. lower and is sagging. Spelter is unchanged and in little demand. Independent sellers of lead have lowered their price again. The syndicate of European antimony producers is a certainty and the high prices are held.

Copper.—Prominent sellers of lake copper made sharp reductions on Saturday and better sales are reported, but on the whole consumers are awaiting a still lower price. Calumet & Hecla copper has been freely offered by those in control of that brand at 12.50c., and some other large sellers have followed suit. As a result, the price of electrolytic promptly dropped off in many quarters where a higher figure had been asked, and it was freely offered in this market at 12.25c. Buyers of electrolytic came back with the an-

nouncement that they were willing to take the metal at 12.25c., delivered in the Naugatuck Valley 30 days, which would make the price for immediate delivery in New York 12.12½c. It seems that buyers of both lake and electrolytic have set the price ½c. lower than that demanded by the selling interest, and considering the weakness of the market it is assumed that holders of copper will soon make offerings at those prices. There are reports that intimations have been given to some preferred customers that sales of electrolytic will shortly be made at 12.12½c., and, as most consumers are not in actual need, buyers generally are playing a waiting game. Copper could be bought in New York this afternoon at 12.50c. for lake, 12.25c. for electrolytic, and around 12.20c. for casting. The exports of copper so far this month have been very light, amounting in all to 10,742 tons. The London market closed strong to-day with spot copper selling at £55 1s. 3d. and futures at £55 13s. 9d. The sales amounted to 400 tons of spot and 1200 tons of futures.

Pig Tin.—Notwithstanding that the arrivals of pig tin in American ports for the first half of the month amounted to 3133 tons, spot tin is decidedly scarce. It is expected that fully 2000 tons more will come into this country before the month is out, and it is very likely that a high record will be established for a month's arrivals. Nevertheless, about all of the tin here, with a great deal of that expected to arrive, has been contracted for, and heavy premiums are demanded for spot. The steamer Mesaba arrived last week with 1175 tons, and the steamer Minnewaska is at dock to-day with 600 tons, while there are 300 tons on board a steamer at Brooklyn. This is an unusual amount to be in port at one time, but practically all of it has been taken and much of it has been sold and resold. If the metal were available at a price reasonably close to the London quotations a good business could be done, but buyers seem to think that the premiums demanded for what little stock is available are unreasonable. The leading consumer controls a large part of the tin now in port and has need of it for early use. Yesterday spot tin was so scarce that tin on board the Minnewaska, which will not be available for a day or so, was quoted as spot. The situation may be slightly bettered at the end of the month, but from all accounts consumers will continue to be at the mercy of the speculative interests to some extent for the next 30 days. Sales of pig tin for spot delivery were made in New York this morning at 39.75c. In London to-day the market closed firm, with spot tin offered at £177 15s. and futures at £177 17s. 6d. The sales amounted to 200 tons of spot and the unusually heavy aggregate of 1150 tons of futures.

Tin Plates.—Tin plates are firm and the demand is steadily and conservatively increasing. Can manufacturers seem to be the largest buyers in this market. Quotations on 100-lb. coke plates remain at \$3.94, New York.

Lead.—Some fairly good sales of lead have been made by outside sellers at lower prices than prevailed a week ago. The leading interest continues to keep its quotation at 4.50c., New York, which is now fully 12½ points above the price set by independent sellers. As a matter of fact, the American Smelting & Refining Company is practically out of the market, except that it is making a few sales of selected brands. The St. Louis market is ragged, and there are reports that the price of 4.22½c. has been slightly shaded there. Plenty of lead can be had in New York at 4.37½c.

Spelter.—Spelter is dull and uninteresting. Prices are nominal, but producers are, as a rule, firm in their demands. It has been said that the generally quoted price in St. Louis of 5.50c. has been cut, but from all accounts this is for resale lots. Sellers are asking 5.50c., St. Louis, and 5.65c., New York, but consumers do not seem interested. Some Western consumers have been inquiring for large lots, but have declined to pay the price asked.

Old Metals.—The market is steadier. Selling quotations are nominally unchanged, as follows:

	Cents
Copper, heavy cut and crucible.....	11.75 to 12.25
Copper, heavy and wire.....	11.50 to 11.75
Copper, light and bottoms.....	10.75 to 11.00
Brass, heavy.....	8.00 to 8.25
Brass, light.....	6.75 to 7.00
Heavy machine composition.....	10.50 to 10.75
Clean brass turnings.....	7.75 to 8.00
Composition turnings.....	8.75 to 9.00
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.95 to 4.00
Zinc scrap.....	4.25 to 4.30

Antimony.—Dealers are eager to sell antimony at recently advanced prices, but buyers are wary and seem to be well supplied, although inquiries indicate that they are watching developments. The report of the formation of a syndicate of foreign makers of antimony has been confirmed to the satisfaction of people in this country most concerned. It is stated that an agreement has been made covering a period of three years. The agreement does not affect all the best known brands of antimony, but producers who are not in the deal are taking advantage of the situation and are

THE IRON AND METAL MARKETS

demanding advances equivalent to those made by the syndicate operators. Cookson's is quoted at 9.50c.; Hallett's, 9.25c.; Hungarian grades, 8.75c.; Chinese, 8.75c. These prices hold good for Cookson's and Hallett's during April and May, but other grades can be had for delivery in those months at 8.60c. The growing demand for Chinese and Hungarian antimony is bringing about an increased production of those brands.

Metals, St. Louis, March 13.—Lead is quiet and steady at 4.25c.; spelter slow and firm at 5.47½c. to 5.50c., both at East St. Louis. Zinc ore is steady and firm at \$39 to \$41 per ton Joplin base. Tin is higher at 42.35c.; antimony (Cookson's) unchanged at 9.85c.; lake copper quoted at 12.95c.; electrolytic copper is easier, quoted at 12.70c., all at St. Louis. The demand for finished metals for the week was moderate.

Metals, Chicago, March 14.—There has been little change in the market. Copper has dropped off a little and is being closely watched. Practically all sales are for spot delivery. We quote Chicago prices as follows: Casting copper, 12½c.; lake, 12¾c., in carloads, for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, carloads, 42½c.; small lots, 44½c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 4.45c. to 4.50c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is \$7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¼c.; copper bottoms, 10¼c.; copper clips, 12c.; red brass, 10¼c.; yellow brass, 9c.; lead pipe, 4¾c.; zinc, 4¼c.; pewter No. 1, 29c.; tin foil, 32c.; block tin pipe, 35c.

Iron and Industrial Stocks

NEW YORK, March 15, 1911.

While transactions have been light, the prices of stocks have been fairly well maintained. The stock market is now almost in a state of suspense, waiting for the Supreme Court's Standard Oil and American Tobacco decisions. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref.....	31½	Railway Spr., com.	32½	34
Beth. Steel, com.....	31¼	Railway Spr., pref.....	98*	98*
Beth. Steel, pref.....	60	Republic, com.....	31½	33½
Can. com.....	9½	Republic, pref.....	98	99½
Can. pref.....	81	Sloss, com.....	52	54
Car & Fdry, com.....	52½	Pipe, com.....	17	17½
Car & Fdry, pref.....	114¼	Pipe, pref.....	58½	58½
Steel Foundries.....	46½	U. S. Steel, com.....	75½	78½
Colorado Fuel.....	32½	U. S. Steel, pref.....	118½	118½
General Electric.....	149	Westinghouse Elec.	67	67½
Gr. N. ore cert.....	59	Va. I. C. & C.....	54	59
Int. Harv., com.....	115½	Am. Ship, com.....	76	76½
Int. Harv., pref.....	124	Am. Ship, pref.....	112	112
Int. Pump, com.....	40	Chl. Pneu. Tool.....	51½	52
Int. Pump, pref.....	88½	Cambria Steel.....	47	48½
Lackawanna.....	44½	Lake Sup. Corp.....	30	31½
Locomotive, com.....	37½	Crucible St., com.....	13½	13½
Nat. En. & St., com.....	17½	Crucible St., pref.....	80½	81½
Pressed St., com.....	32½	Harb.-W. Ref., pref	95½	95½
Pressed St., pref.....	97			

* Ex dividend.

The Empire Steel & Iron Company, Catsauqua, Pa., reports its total net earnings for the year ending December 31, 1910, at \$257,690 and the total net profits, after deducting the customary allowance for improvement, permanent repairs and depreciation of property, \$154,834, leaving a balance, after deduction of dividends, of \$29,834.

The Crucible Steel Company of America, Pittsburgh, for the five months ending January 31, shows net earnings, after deducting all charges for maintenance and repairs, of \$1,098,650, which added to the surplus of \$2,448,040 reported in August, 1910, makes \$3,546,690; subtracting two dividend payments amounting to \$855,278, leaves an undivided surplus of \$2,691,412.

The Western Electric Company has declared the regular quarterly dividend of 2 per cent., payable March 31.

The Boston Belting Company has declared the regular quarterly dividend of 2 per cent. payable April 1.

The American Iron & Steel Mfg. Company has declared the regular quarterly dividend of 1½ per cent. on both common and preferred stocks, payable April 1.

The Otis Elevator Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock and a quarterly dividend of 1 per cent. on the common stock. The last quarterly dividend on the common stock was ¾ of 1 per cent. Both are payable April 15.

The Westinghouse Air Brake Company has declared the regular quarterly dividend of 2½ per cent., an extra dividend of 1½ per cent., and a special dividend of 1 per cent., the same as three months ago, payable April 10.

The Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

The American Brake Shoe & Foundry Company has declared the regular quarterly dividends of 1¾ per cent. on the preferred stock and 1¾ per cent. on the common stock, both payable March 31.

Notes on Prices

Rope.—The troubles in Mexico have not affected the price of sisal fiber one way or the other, which has been somewhat of a surprise to some in the cordage business. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure Manila of the highest grade, 8½c. to 9c. per pound; second grade Manila, 7½c. to 8c. per pound; hardware grade, 7c. to 7½c. per pound; pure sisal of the highest grade, 6½c. per pound; second grade, 6c. per pound; rove jute rope, ¼-in. and up, No. 1, 6½c. to 7c. per pound; No. 2, 6c. to 6½c. per pound.

Linseed Oil.—The market is strong, but with little buying, although about this time of year the demand usually increases. Foreign markets are short of oil and are unable to procure seed, as is shown by the action of some foreign crushers in offering to pay a premium to be permitted to cancel contracts which had been placed by American buyers. This is the second time within a comparatively short period that foreign manufacturers have asked to be relieved from filling American orders. For carloads of raw domestic oil 94c. to 95c. per gallon is quoted. The following quotations represent New York prices in five-barrel lots or more:

State, raw.....	Cents.
City, raw.....	85
Oil in lots of less than 5 bbl., 1 cent advance per gallon.	85
Boiled oil, 1 cent advance per gallon over raw.	

Naval Stores.—Turpentine prices have advanced at this point in sympathy with Southern markets, where receipts are light and find ready buyers. Higher prices are predicted by some in the trade. New York turpentine quotations in five-barrel lots are as follows:

In oil barrels.....	Cents.
In machine barrels.....	95½
Less than 5-bbl. lots, ½ cent advance per gallon.	96

Rosins are firm and higher, following Southern markets. On the basis of 280 lb. to the barrel common to good strained is quoted at \$7.70 and grade D at \$7.85 in the New York market.

President Maben on Pig Iron Conditions

J. C. Maben, president of the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala., in a newspaper interview given in New York this week, says that his company is now operating about 60 per cent. of its capacity, and that it now has 98,000 tons of pig iron in its yards, which is large compared with stocks in other years. The company, he says, has sold some large blocks of iron, and is still selling, mostly for third and fourth quarter deliveries. Its price for early delivery is \$11 for No. 2, at Birmingham, \$11.25 for third quarter and \$11.50 for fourth quarter. His company sold very little iron below \$11 when conditions were most stagnant. Concerning the outlook, he says: "I am at a loss to make any prediction as to the future course of the iron market. Things still seem to be unsettled, notwithstanding forthcoming reports of prosperity for steel manufacturers. In my opinion everything will depend upon the action of the railroads. We undoubtedly have to look forward to this source of outlet more, in fact, than previously. There is no doubt that the railroads are curtailing expenses, but for how long and to what extent remains to be seen. Industrial conditions have been lagging for more than a year now, and it would seem that an upward trend is in sight. However, conditions are still too unsettled to venture anything definite as to the future."

The plant of the Independent Steel Company, Kenova, W. Va., with the sole exception of the spring department, has been shut down by the receiver.

The Cincinnati Foremen's Club

Other industrial centers would probably be interested in the success of the Foremen's Club of the Cincinnati Continuation School. At its night session March 10 about 10 members were present, and the main question discussed was "What Constitutes a Successful Foreman?" One of the chief points brought out was that of the willingness of a foreman to sacrifice his own department to make other departments successful, if it meant a saving to the company financially. The proposition also as to the limits a foreman ought to go in giving his operatives liberties brought out the fact that it was frequently necessary to give one man more liberty than another, depending largely on the class of his operation on a machine, as in numbers of cases there was a greater strain on the workman's eyes, or his nervous system was more severely taxed.

The question of premiums or bonuses was discussed at length, the general conclusion being that nothing satisfactory had yet been developed along that line, although it was agreed that the system is more satisfactory in plants where a close study is made of individuals. Social relations between a foreman and his workmen, as well as those that exist between the foreman and his employer, were very intelligently discussed, many agreeing that it was a commendable and profitable idea to join as much as possible in the social pastimes of a workman. The sentiment seemed strongly in favor of the idea that a man who never made mistakes was "too slow to drive snails to water," as one foreman expressed it. The ideal foreman was agreed on as one who corrected his operatives privately; cooled them down when spoiled work and bad conditions angered them, and relaxed them when the work taxed their nerves, due to too constant application.

The following foremen read papers and were frequently interrupted to discuss different points brought out: Frank Kamerer of the J. A. Fay & Egan Company; William Siebert, R. K. Le Blond Machine Tool Company, and William Eggebrecht, Kern Machine Tool Company. Prof. J. H. Renshaw, dean of the Continuation School, inaugurated these foremen's meetings that have developed into enthusiastic gatherings where there has been an interchange of many valuable ideas between the participants.

The Effect of Titanium Alloy on Slags.—The Titanium Alloy Mfg. Company, 1225 Oliver Building, Pittsburgh, publishes a new pamphlet entitled "Titanium in Steel." It presents interesting details of the results of more recent practice in the use of ferrotitanium in rail and other steels. Some new material is given in a discussion of the effect of titanium alloy on slags. Testimony on this point is given by a number of well-known metallurgists to the effect that titanium not only eliminates nitrogen and oxygen, but also by forming titanium oxide imparts fluidity and causes the elimination of slags. The fluidity due to the presence of titanous acid has been found to be greater than is imparted by the oxidation of manganese, aluminum or silicon, and titanium secures the entire removal of slags, as is not the case with the other elements that have been used for the cleansing of steel.

W. W. Lindsay & Co., Harrison Building, Philadelphia, Pa., have purchased a tract of six acres of land on the Pennsylvania Railroad below Chester, Pa., on which they will erect a large building for the storage of structural material and miscellaneous contractors' equipment and tools. Details are not yet decided upon, as they will draw their own plans and do their own erecting work. Reports that a shop for fabricating structural material would be erected are denied, although some time in the future they may decide to engage in that character of work.

The Standard Chain Company, Pittsburgh, has received an order from the Isthmian Canal Commission, Washington, D. C., for 2600 ft. of 1½-in. hoisting chain.

The Ducharme Wrench & Novelty Mfg. Company's Removal

The Du Charme Wrench & Novelty Mfg. Company, Johnstown, Pa., announces that owing to the fact that it has been located in leased quarters, and that the Baltimore & Ohio Railroad Company has appropriated its site, it is now moving to Cambridge, Ohio. The Cambridge Board of Trade gave the company as a bonus a most desirable site of 2 acres along a continuous switch, with common privileges to the Baltimore & Ohio and the Pennsylvania railroads. It is erecting a large brick building, 60 x 300 ft., in which it is installing the most improved machinery for the manufacture of wrenches, pipe vises and pipe cutters. The tools which the company manufactures are all patented, are novel and practical, and consist of the following: A quick adjusting open top pipe vise, a quick adjusting bench vise, a wall or ceiling fixture wrench, a self-adjusting wrench, an adjustable alligator wrench, an automobile turret head wrench and a combination roller chain pipe cutter and wrench. These tools are manufactured of all drop forgings. The new plant will be in operation and in position to ship goods about June 1.

The Tacoma Foundry & Machine Company, Tacoma, Wash., is erecting a new jobbing foundry plant on about a 3-acre site, within a mile and a half of the business center of the city. It contemplates at present the foundry line only, without any machine shop. It has secured the valuable outfit of patterns owned by the late Gawley Foundry & Machine Works, has purchased its complete foundry equipment, and expects to be in operation the latter part of this month. The company will then be in position to take care of the large foundry requirements of the lumbering interests of the district. John Taylor is president; Wilson Webb, vice-president, and Thomas B. Hall, secretary and treasurer.

Samuel W. Hays' Sons, manufacturers' agents, Keenan Building, Pittsburgh, have sold to the Diamond Alkali Company, Fairport, Ohio, three cross compound four-valve Corliss engines made by the Ridgway Dynamo & Engine Company, direct connected to 250-kw. direct current Ridgway generators; to the Republic Iron & Steel Company, Youngstown, Ohio, three Whiting electric cranes; to the A. M. Byers Company, Pittsburgh, one Whiting crane, and to J. J. Kennedy, for installation at Darlington, Pa., a 16 x 18 in. Ridgway engine.

The Morris Machine Works, Baldwinsville, N. Y., corrects an erroneous item which appeared in *The Iron Age* of March 2, on page 558, stating that the business and plant of the company had been taken over by the Valley Iron Works, Williamsport, Pa. The fact is that the Valley Iron Works has purchased the Morris Coupling Company, Baldwinsville, which manufactures compression couplings and is in no way connected with the Morris Machine Works.

A report in Philadelphia and Reading newspapers last week announced a serious accident at one of the Empire Steel & Iron Company's crane furnaces at Catasauqua, Pa., with a reported loss of \$20,000. This was nothing more than a "break out" at the No. 2 furnace, a not unusual occurrence in blast furnace practice, and the loss entailed was less than \$500. The furnace was stopped but 12 hours and has since been operating regularly.

The Cleveland Crane & Engineering Company, Wickliffe, Ohio, has received a contract from the United States Government for eight motor-driven traveling wharf cranes for installation at Balboa on the Panama Canal for loading and unloading vessels and freight cars.

On petition of creditors, R. L. Blackmore has been appointed receiver of the Standard Nipple & Tool Company, West Newton, Pa. Insufficient capital is given as the cause.

The Pipe Jobbers' Convention

The second annual convention of the National Association of Jobbers of Wrought Iron Pipe and Fittings was held at the Hollenden Hotel, Cleveland, Ohio, March 14 and 15. About 125 members were present. The organization is in a flourishing condition and now has a membership of about 220. It is stated that at present 90 per cent. of the tonnage in pipe and fittings is handled by jobbers who are members of the association.

The convention opened Tuesday morning with an open session. The other sessions, Tuesday afternoon and Wednesday morning and afternoon, were executive. President A. E. Ford, Ford & Kendig Company, Philadelphia, presided at the opening session, his introductory remarks largely relating to the improved outlook in business conditions. A general discussion of the business situation followed, both manufacturers (a number of whom attended this session) and jobbers being called upon for an expression of opinion. The reports were optimistic from all sections of the country.

At the first executive session Tuesday afternoon President Ford made his annual address, reports were submitted by other officers, new business was taken up and there were discussions on the following subjects: "Unintelligent Competition," "Price-List on Malleable Fittings" and "Cost of Doing Business." The programme Wednesday morning included reports of the pipe, fittings and seamless brass and copper tubing committees with discussions of these reports, reports of members of the Territorial Committee on conditions in their territory, discussion of "Standardization of Weight of Wrought Pipe, Sizes $\frac{1}{8}$ to 6-In.," opened by W. B. Henion, Henion & Hubbell, Chicago; discussion of "Resale Prices," opened by W. M. Pattison, Pattison Supply Company, Cleveland, and discussion of "Manufacturers' Competition," opened by W. L. Rodgers, Pittsburgh Gage & Supply Company, Pittsburgh, Pa.

The topics of discussion Wednesday afternoon were "Competition Based on Vindictiveness," opened by J. P. Fell, W. A. Case & Son Mfg. Company, Buffalo, N. Y.; "Competition Based on Honesty, Quality and Service," opened by George W. K. Taylor, McMann & Taylor, New York City, and "Should We Not at All Times Be Rebated for Decline in Price on Stock on Hand at Time of Such Decline?" opened by Francis J. Baker, George H. Tay Company, San Francisco, Cal. The convention closed late Wednesday with the election of officers. The entertainment included a vaudeville programme, smoker and luncheon at the Hollenden Hotel Tuesday evening and a theater party at the Hippodrome Wednesday evening. On Monday the delegates were taken to Lorain, Ohio, to inspect the plant of the National Tube Company.

British Steel Companies Not Prosperous in 1910.—

In connection with the forty-seventh annual meeting of the Barrow Hematite Steel Company, Ltd., in London recently, the fact was again emphasized that 1910 was not a good year for British iron and steel works. Early in the year the outlook was favorable, partly because of the then excellent condition of the American iron industry, but unfavorable influences appeared before the first half of the year was over. The company produced 270,000 tons of pig iron, against 215,000 tons in 1909, but while this indicated improvement attention was called to the small margin between cost and selling price, the latter being low while the price of iron ore was abnormally high. The company kept its rail mill quite well employed, but it also made sheet bars and billets, for which prices were not well maintained. But for the desire to keep down overhead charges and to retain its men the company would not have entered these latter lines at all.

The report of the American Railway Association shows that on March 1 the number of idle freight cars in the United States was 189,841, compared with 173,667 on February 15. At the beginning of March, 1910, idle cars numbered about 15,000.

The R. D. Nuttall Company Buys the Hydraulic Machine Company's Plant

Negotiations were consummated March 13 by which the R. D. Nuttall Company, Pittsburgh, bought the entire plant of the Hydraulic Machine Company, belonging to the Henry Alken Estate, which has been idle for some time. The transaction is one of the largest of its kind that has taken place in the Pittsburgh district for some years. The Hydraulic Machine Company is located at Fifty-fourth street and the Allegheny Valley Railroad, and has about six acres of ground. It embraces buildings and other appointments of modern construction, comprising a large foundry with two open hearth steel furnaces, a large structural shop with a full equipment of tools, an erecting shop of large size, a fine well-furnished machine shop, power house and several auxiliary buildings. It is the intention of the R. D. Nuttall Company to take possession of the plant as soon as possible and to put it in partial operation in the manufacture of cut gears. The equipment will be moved from the present plant of the R. D. Nuttall Company, at Fayette street and Garrison place, Pittsburgh, to the works just purchased, concentrating all manufacturing operations there as soon as it can be done, when the old plant will be abandoned. The company will more than double its capacity in the manufacture of cut gears, and will make it much the largest in the country in the manufacture of this product. The R. D. Nuttall Company is one of the Westinghouse interests, and has built up a very large domestic and foreign trade.

Philadelphia Foundry Foremen.—The regular monthly meeting of the Associated Foundry Foremen of Philadelphia and Vicinity was held at the Manufacturers' Club, Philadelphia, on the evening of March 14, with President Clarence R. Brown in the chair. George M. Beukert, treasurer, tendered his resignation, and D. M. Kittenger, secretary, was elected acting treasurer, pending the auditing of the retiring treasurer's accounts. John Birkinbine and Dr. Elmer E. Brown were elected honorary members. The paper for the evening's discussion was on "Some Incidents in the History of the Iron Trade," by George C. Davis, official chemist of the association. Mr. Davis illustrated his paper by numerous lantern slides, showing the progress from the early furnaces in Virginia to the present day types, and referred to the various methods of making pig iron, wrought iron and steel from the old crude processes to those of the present day.

At the annual meeting of the stockholders of the Taylor Iron & Steel Company, held at High Bridge, N. J., March 7, reports showed that the earnings for the year 1910 were so satisfactory that besides the regular 7 per cent. dividend on the preferred stock, amounting to \$35,000, a 3 per cent. dividend on the common stock, amounting to \$15,000, had been paid February 1, 1911, and in addition thereto substantial sums passed to the surplus and reserve accounts. The company reports its business as being in a most prosperous condition, and, with its recently completed additions to its plant and equipment, believes it has every reason to look forward to an increase for the coming year. The retiring Board of Directors was re-elected.

The plant of the Hicks Locomotive & Car Works, Chicago Heights, Ill., which has been in the hands of a receiver for some time, has been purchased for the sum of \$470,000 by William Barbour, who has conveyed the property to the Central Locomotive & Car Works. This company has filed articles of incorporation with \$600,000 capital stock. It is the intention of the new company to operate the plant at full capacity. The officers of the company are: William McInnes, president; A. M. Gardner, vice-president; William Barbour, treasurer; C. B. Bruce, secretary. The headquarters of the company are in the Fisher Building, Chicago.

Personal

The rumor has been current in the past week that Wm. B. Dickson has tendered his resignation as first vice-president of the United States Steel Corporation, effective May 1.

H. W. Bryant has sold his interest in the Rolfe Iron Company, Chicago, to Marcus C. Aurelius, cashier of the Pullman Trust & Savings Bank. Mr. Aurelius will occupy Mr. Bryant's position as secretary and treasurer of the company.

The Pawling & Harnischfeger Company, crane manufacturer, Milwaukee, Wis., at a recent meeting of the Board of Directors, elected S. H. Squier, who has been with the company for a number of years, a director and secretary of the company. W. H. Hassenplug, sales manager, was elected a director and second vice-president, and F. P. Breck, also associated with the company for many years, was elected a director. A. Pawling, president of the company, is on an extended automobile trip through the Southern and Pacific Coast States, and will return to Milwaukee in June.

J. E. A. Moore, who was associated with the late John W. Seaver, consulting engineer, Cleveland, Ohio, has accepted the position of chief engineer for the C. O. Bartlett & Snow Company, Cleveland.

John F. Nisbet, in addition to his duties as advertising manager of the Triumph Electric Company, Oakley-Cincinnati, Ohio, has been selected as manager of the publicity department of the Triumph Ice Machine Company.

Mitchell Pier, formerly foreman of the transformer department, Canadian General Electric Company, has joined the staff of the Triumph Electric Company, at Oakley-Cincinnati, Ohio.

Charles A. Schieren, Jr., of the Charles A. Schieren Company, leather belting manufacturer, 37 Ferry street, New York, has returned from a stay of several weeks in Europe, where he visited the company's branch offices.

Moses Nelson Baker, editor *Engineering News*, New York, will address the Thomas S. Clarkson Memorial School of Technology, Potsdam, N. Y., at the charter day exercises of the fifteenth anniversary, on the evening of March 17. His subject will be "The Engineer and Social Service."

Ellsworth M. Taylor, who has been connected for a number of years with Touche, Niven & Co., New York, as a specialist in works organization, production costs and accounting, has opened an office in his own name at 30 Broad street New York. He has taken over all of his personal business and will continue in the same line of work.

George K. F. Cotton, who has been selling mining equipment in Johannesburg, South Africa, is spending several weeks in this country.

Henry Metzler of the New York Metals Selling Company and A. Burton Cliff of the United States Smelting Works, Philadelphia, have been elected members of the New York Metal Exchange.

The Shelby Iron Company, Shelby, Ala., states that the name of the new manager of that company is Joseph W. Keffer and not James, as printed in the last issue of *The Iron Age*.

Dr. Ing. F. A. Springorum of Dortmund, Germany, son of the president of the Verein deutscher Eisenhuettenleute, who has been in this country since October, has returned home. While here he filled important engagements as a metallurgist with the Illinois Steel Company and the Tennessee Coal, Iron & Railroad Company, and now returns to Germany to take a responsible position in a similar capacity.

Werner F. von Siemens, junior chief engineer of the Siemens-Schuckert Works, Berlin, which is the largest German electrical manufacturing firm, and Kurt Maleyta and Johannes Buppe, who are assistant engineers, are spending several weeks in this country visiting American machinery manufacturing plants. Accompanying the party is Prof. Adolph Wallich, instructor of metallurgy in the

Technical High School of Aix la Chapelle, who is visiting American industrial schools.

R. A. McKinney, Farmers' Bank Building, Pittsburgh, formerly purchasing agent of the American Sheet & Tin Plate Company, has taken the Pittsburgh agency for the Manhattan Rubber Company, Passaic, N. J., which manufactures mechanical rubber goods. It will open a warehouse in Pittsburgh in the near future.

D. B. Meacham of Rogers, Brown & Co., Cincinnati, has returned from a stay of several weeks in Bermuda.

The March meeting of the Cleveland Branch of the American Chemical Society was addressed by W. R. Hulbert, manager of sales of the Goldschmidt Thermit Company, on the thermit welding process, illustrating the process and its various applications with lantern slides, and giving a demonstration of thermit welding. Much interest was shown in the demonstration, which was witnessed not only by the local members of the society, but by members of the American Society of Mechanical Engineers, and others who came from places as remote as Akron and Lorain.

Arthur J. MacBride, Chicago manager of the Pocahontas Fuel Company, has been promoted to the position of assistant general manager of that company, with headquarters in New York. He will be succeeded by L. M. Breeden, one of the company's traveling salesmen out of Detroit.

George B. Mitchell has been appointed to succeed Walter G. Miller, deceased, as assistant to Roland Gerry in the cold rolled and power transmission sales departments of the Jones & Laughlin Steel Company, Pittsburgh, Pa.

Edwin P. Brown, Newton, Mass., has been elected general manager of the United Shoe Machinery Company, Beverly, Mass., to succeed Charles H. Wilson, deceased.

The Universal Stenotype Company, Dallas, Texas, has completed the plans for its factory. The plant will consist of three buildings. The main building and office building will be two stories and the foundry one story. The specifications call for 47,000 sq. ft. of floor space. All buildings will be of absolutely fireproof construction, and in all probability of reinforced concrete, with steel sash. The machinery will be direct motor driven, but as the company will purchase its electric power, it will not be interested in boilers or generators. The company is in the market for office, factory, foundry, woodworking and tempering equipment. It is desirous of getting in touch with manufacturers of heating and electrical apparatus, as well as contractors for their installation.

The Elevator Safeguards Company, Indianapolis, Ind., has been incorporated with \$50,000 capital stock to manufacture an automatic elevator safety device formerly made by the Elevator Safety Equipment Company of the same city. The device prevents the elevator shaft door from being opened except while the car is level with the landing and prevents the starting of the car before the door has been closed. The company will be under the management of John W. Stearns. A factory building will not be erected at present, the company having made arrangements for the manufacture of its product.

The Hart-Parr Company, Charles City, Iowa, issues an interesting pamphlet describing what it terms "the modern farm horse." This is a 30 to 45 hp. kerosene tractor which will at one time pull five or six plows, turning furrows 14 in. deep, or two 10-ft. harrow discs and a drill, or three 8-ft. grain binders. It is claimed that in all kinds of ground two men will average 25 acres a day in plowing with this tractor. The company has a very large plant devoted to the manufacture of these tractors, which shows the striking progress that has been made in their introduction for farm purposes.

The Pennsylvania Railroad has placed a contract with the Wellman-Seaver-Morgan Company for a new ore handling plant in Cleveland, Ohio, consisting of four 15-ton unloaders and a 612-ft. bridge, equipped with 15-ton buckets.

Obituary

CURTIS GUILD, SR., founder and editor of the *Commercial Bulletin*, Boston, Mass., died March 12, aged 84 years. He was born in Boston and was educated in the local public schools. He entered newspaper life on the *Boston Daily Journal*, and later went to the *Boston Daily Traveler*, becoming one of the proprietors of that paper under the firm name of Worthington, Flanders & Guild. About 1858 he began the publication of the *Commercial Bulletin* which is one of the leading business journals of the country. His son, Curtis Guild, Jr., was recently Governor of Massachusetts.

ROBERT WALLACE, Cleveland, Ohio, a pioneer shipbuilder on the Great Lakes, died at St. Petersburg, Fla., March 7, aged 76 years. He was born in Ireland and located in Cleveland when about 20 years of age, securing employment in a machine shop. In 1869, with others, he purchased a machine shop which the new owners named the Globe Iron Works. Later he was one of the organizers of the Cleveland Drydock Company and of the Globe Shipbuilding Company, the latter afterward being taken over by the Globe Iron Works Company. In 1886 Mr. Wallace and associates formed the Cleveland Shipbuilding Company, of which he was made president. In 1899 the American Shipbuilding Company was formed to take in the shipbuilding plants at Cleveland and several other lake ports and Mr. Wallace took an active interest in the latter company until seven years ago. He leaves a widow, three sons and two daughters. The sons are connected with the American Shipbuilding Company, James C. Wallace being president; R. B. Wallace, general manager, and Lindsay H. Wallace, assistant manager.

CHARLES S. DICK, for 18 years connected with the McKenna Brothers Brass Company, Pittsburgh, died at his home at Sheridan, Pa., March 7, after a long illness, aged 38 years. He leaves a widow and three children.

FRANK S. LAYNG, president of the Illinois Zinc Company, Peru, Ill., died at his residence in New York City February 11.

Railroad Equipment Orders.—The B. & O. has ordered 1000 box cars and the Nashville, Chattanooga & Southern 100 from the American Car & Foundry Company. The recent order of the American Refrigerator Transit Company was for 1000 cars. The Ann Arbor has bought 110 freight cars, the Chicago, Indianapolis & Louisville 300, and the Richmond, Fredericksburg & Potomac 50. The Illinois Central will build 500 refrigerator cars in its own shops. The Algoma Central & Hudson Bay Railroad has ordered 175 steel under frame flat cars from the Canadian Car & Foundry Company, and 50 ore cars from the Hart-Otis Car Company. The New York, Westchester & Boston has bought 30 passenger cars from the Pressed Steel Car Company. The Rock Island is expected to buy 1450 freight cars, the Atlantic Coast Line 1200 to 1400, the Seaboard Air Line 1200 and the Western Maryland 500. The Lackawanna has ordered 35 locomotives, the Atlantic Coast Line 29 and the Illinois Central 40. The Pere Marquette is inquiring for 50, the Kansas City Southern for 20 and the Western Maryland for 40.

At the annual meeting of the stockholders of the Lackawanna Steel Company, held March 8 at the new general offices of the company at its plant at Lackawanna City, near Buffalo, N. Y., the following, whose terms expired, were re-elected for the full term of three years: E. A. S. Clarke, William L. Brown, Edwin S. Marston, Samuel Mather, Ogden Mills, Moses Taylor Pine and William K. Vanderbilt. James A. Campbell was also elected a director, his term expiring in March, 1913.

Sidney Wheelhouse, Pittsburgh representative of the Hoover-Owens-Rentschler Company, Hamilton, Ohio, has sold to the Portsmouth Steel Company, Portsmouth, Ohio, a 32 x 54 in. heavy duty Hamilton-Corliss engine for rolling mill work.

A Great Power Development in Eastern Pennsylvania

Generation of electric power from anthracite coal directly at the mine, with the distribution of such power by high voltage transmission lines to industries in surrounding territory, ultimately even as far as Philadelphia, is to be undertaken on a big scale by the Lehigh Coal & Navigation Company. The project contemplates an expenditure of \$3,000,000 now, and of \$10,000,000 in all. This electric power plant will, according to proposed plans, be located 10 miles west of Mauch Chunk, at Hauto, Pa., adjacent to one of the company's coal mines, and also where an abundant supply of water is available. An existing reservoir will be increased by the construction of a higher dam to a storage capacity of 1,000,000,000 gal. and an area of about 400 acres. The company owns the entire drainage basin.

The first unit of the power plant will have a supply capacity of 20,000 kw. To insure this, three electric generators of 10,000 kw. will be installed. Gradually the plant is to be enlarged to 100,000 kw. capacity. Within a year the company expects to have the first section of the Hauto electric power plant in operation. The plan is to supply electric current first to the cement and slate industries in Lehigh and Northampton counties. These are in a territory from 20 to 40 miles distant from the proposed plant. From the Hauto plant alternating current of a very high voltage will be carried by transmission lines to four transforming stations at Slatington, Nazareth, Bath and Bangor, Pa., where it will be stepped down, and, where necessary, transformed into direct current for delivery to consumers. The transmission lines will be constructed largely along the Lehigh Navigation Canal and on the right of way on the controlled Lehigh & New England Railroad. As the plant is increased the idea is to carry electric power to Allentown, Easton, Trenton, and, ultimately, probably throughout the section to Philadelphia.

The electric power and distribution service, which the Lehigh Coal & Navigation Company is preparing to introduce, will be conducted by subsidiary companies controlled by it and through which it will finance the undertaking. Charters for 25 such companies have been applied for under the laws of the State of Pennsylvania, the incorporators in each case being W. A. Lathrop, Rollin H. Wilbur and H. F. Baker, all officers of the Lehigh Coal & Navigation Company.

Republic Blast Furnaces All Active.—The Republic Iron & Steel Company blew in its No. 3 Pioneer furnace at Thomas, Ala., March 12. It now has all of its nine furnaces in blast, Hall furnace in the Shenango Valley having gone in in February. Its Bessemer steel department at Youngstown is operating at 100 per cent. of capacity, while its new tube works are now running at about 70 per cent. of their rated output. The Brown-Bonell mills at Youngstown are running practically full, though some of the hand mills at this plant and the Mahoning Valley works are not fully employed.

The United Engineering & Foundry Company, Pittsburgh, put in operation March 6 one of its high speed steam hydraulic forging presses at the Mare Island Navyyard, another March 7 at the works of the Titusville Forge Company, Titusville, Pa., and March 8 shipped one to the Westinghouse Electric & Mfg. Company, East Pittsburgh, which will be in operation about April 1. The first named press is of the single frame type, of 300 tons capacity, and the other two are of the four-column type of 1,000 tons capacity.

The Fort Pitt Bridge Works, House Building, Pittsburgh, is making an addition, 65 x 400 ft., to its plant at Canonsturg, Pa. Contracts on hand include a steel pier at New Orleans, La., and a steel bridge across the Ohio River at Sewickley, Pa., which is more than half completed.

A Coal Miners' Compensation Plan

A Fund to Be Raised by a State Tax of One Cent Per Ton

The American Mining Congress is distributing copies of a proposed plan to provide compensation for the victims of coal mine accidents and a pension for aged coal mine workers. The plan takes the form of a bill and has been in preparation for a considerable time by a committee of that organization composed of John H. Jones, David Ross, W. R. Woodford and J. W. Dawson. The following are some of its principal provisions:

Section 1 authorizes the legal taxing authority of a county to levy a special tax of 1 cent per ton on all coal mined and shipped or sold locally.

Section 3 requires State treasurers to keep the proceeds of such taxes in a separate fund to be known as the Employers' Accident Indemnity Fund.

Section 4 provides that all employees in and around coal mines, coal washers and tipples shall be entitled to receive indemnity for all injuries caused by accidents, and a monthly benefit during disability occasioned by old age, the basis of compensation to be the average monthly wages received for the five years immediately preceding such accident, but in no case to exceed \$70 for each month, the monthly benefit to be in no case more than \$35 or less than \$25. If an accident results within 30 days in the death of the workman the legal representatives of each single man shall receive from the fund \$500; the legal representatives of each head of a family living with or supporting such family shall receive \$500, and in addition thereto a monthly benefit for three years following the accident a sum equal to 50 per cent. of such workman's average wages plus 10 per cent. of such average wages for each child under 16 years of age at the time such benefits are payable, and 10 per cent. of such wages additional for five or more years of continuous service with his then employer, but in any case such monthly payments shall not exceed the average wage of such employee nor the total sum of \$3000. If the injuries incapacitate the workman from the pursuance of his usual work, he shall during such incapacity receive a monthly benefit equal to one-half of the amount of his average monthly wages during the preceding year plus 10 per cent. of such wages for each child under 16 at the time such benefits are payable and 10 per cent. of such wages for five or more years of continuous service with his then employer, but such benefits are not to exceed the total sum of \$2000. It is provided that a workman shall receive for the loss of one hand 12 months' wages; one arm, 18 months' wages; one foot, 9 months' wages; one leg, 12 months' wages; one eye, 6 months' wages; both hands or both arms or both feet or both legs or both eyes, a sum equal to his average wages for a period of four years, but not to exceed the sum of \$3000. Any workman employed for 25 years in the coal mining industry, for the last 10 years of which he shall have been so employed within the State, when he reaches the age of 65 years and becomes unable to perform his usual labor or labor of any sort about any mine, washer or tippie, by reason of old age, shall be entitled to receive a sum equal to 50 per cent. of his average monthly wages during the preceding 10 years. Proper restrictions are made so as to guard against imposition.

Section 8 provides for an Advisory Board of three to be appointed by the Governor, one of whom shall be a representative coal operator and one a representative coal miner, who will have general control and supervision of the administration and execution of the provisions of the act.

Section 9 provides that if the special tax shall be found at the end of three years to be in excess of the amount needed the State Auditor is authorized to change the amount of the levy provided for.

It is the intention of the American Mining Congress to submit the bill to the legislatures of the several coal producing States as a practical solution of a problem

which is now causing a very great deal of trouble. It is the purpose of the bill to provide means by which the necessary victims of the mining industry may be cared for. By the plan proposed the burden of losses entailed by such accidents is equalized, certainty of settlement is insured and the opportunity is given to add this expense to the cost of production in such a way as to place the burden upon the ultimate consumer who should be willing to pay the actual cost of production plus a reasonable profit. The permanent headquarters of the association are at 1510 Court place, Denver, Colo. The secretary, J. F. Callbreath, Jr., has a temporary office at Bancroft Hotel, Washington, D. C.

The British Iron Market

Reports from the British iron trade indicate that conditions are not as favorable in pig iron as they were at the opening of the year, while in finished material they are only fairly satisfactory. Makers of Cleveland pig iron do not take a very hopeful view, chiefly for the reason that pig iron stocks in Connal's stores have been steadily increasing. On March 2, 1911, the total of Cleveland iron in store was 570,707 tons, against 411,357 tons on March 3, 1910. The increase in February was 17,181 tons, against 21,769 tons in January, 22,334 tons in December and 20,575 tons in November. Cleveland warrants have touched 48 shillings 7½ pence, which was the minimum in 1910. The idea entertained at the beginning of the year that prices might advance in the first quarter has been given up. The East Coast hematite pig iron trade is less satisfactory and prices are weaker. Producers are asking 65 shillings for delivery in the first half, while hematite iron in second hands is sold at 64 shillings 6 pence. Spanish ores continue high, quotations on Rubic ore being 22 shillings 6 pence, delivered. The coke trade is also suffering from overproduction. The usual price is 15 shillings 6 pence for furnace coke, delivered at Middlesbrough.

New orders for finished steel are not plentiful, but mills still have good specifications, particularly in ship-building material. Rails have been in a little better demand and the basis of £5 15 shillings is firmly held. On the Northeast Coast steel ship plates are quoted at £6 15 shillings, which is 10 shillings above the basis of one year ago. In South Staffordshire, the finished iron trade is feeling Belgian competition on bars. The tin plate trade is quiet, but Welsh mills are very well occupied. The common quotation for Bessemer I. C. coke plates, South Wales, is 15 shillings. Reference is made by the *Ironmonger* to the sale of black plates covered with aluminum on one side only. Arrangements have been made by the British patentees for their manufacture in Germany, Holland and France.

The United States Supreme Court, March 13, in an opinion read by Justice Day, upheld the constitutionality of the corporation tax. The decision was unanimous. The court held that the corporation tax was enacted by Congress, and that the Constitution clothed it with the taxing power; that it was uniform throughout the United States, and affected all alike; that it did not invade the rights of the State; that Congress, having the power of taxation, when it exercised it, without discrimination, the question resolved itself as to the wisdom of Congress, which, even if wrong, was a matter for the voters, and not the courts, to pass upon. The corporation tax law is a section of the tariff law of 1909.

The Lehigh Valley Railroad is planning new and improved iron ore and coal docks at its Blackwell Canal terminals at South Buffalo, N. Y., to cost approximately \$500,000. The ore docks will be constructed of concrete for surface storage and will be equipped with a number of the latest type of electrically operated Hewlitt unloaders. On the opposite side of the canal from the ore docks, the coal docks and chutes heretofore in use will be replaced by a series of trestles and coal pockets to provide for the more expeditious loading of anthracite into vessel holds.

Business Administration as a Constructive Science

Its Field of Application Not Confined to Production or Any Other Single Department—
The Various Divisions Co-ordinate

BY H. F. STIMPSON.*

In a recent article in these columns,† I endeavored to show that administration may be considered as an exact science, having its own particular formulae, which can be applied to any line of business as well as the science of applied mechanics or that of arithmetic. The object of this article is to correct a somewhat common misapprehension as to the real purpose for which this science is employed.

Interviews with prominent men in many of the larger cities of the United States have furnished me with abundant evidence that the purpose of administration is commonly believed to be the direct control of physical force, either human, animal or mechanical. This belief, however, does not seem to be warranted by the facts.

Mental Force and Physical Force

Man differs from an animal or a machine in that he possesses a mental force through which he can direct not only his own physical force and that of other men, together with that of animals and machines, but by which also he can control the mental force of other men and through them the physical forces which they may control or direct.

If such are the facts it is even of more importance that we should understand the laws governing the control and direction of this mental force than the laws regarding physical force. That such are the facts may be inferred from the following:

1. Man is dependent on commodities for both existence and pleasure.
2. A commodity is material to which force has been applied with such results as to fit it for the use of man.
3. Force may be divided into two types: (a) Physical force, which is applied directly to the material and may be of either animal or mechanical origin; (b) Mental force, by which the physical force of men, animals or machines is either controlled or directed.
4. Mental force is a prerequisite to the intelligent use of physical force toward a given end.
5. Mental force is one of the peculiar possessions of man which distinguishes him from animals.
6. The real value of a commodity among men is, then, proportionate to the amount of mental force, even more than to the amount of physical force, which has entered into its production. Real commerce, therefore, is to be found in the exchange of mental force far more than of physical force, or of the commodities produced by force, or even of money, which is not a force at all but a mere token of force.
7. Mental force is an inherent possession of man from birth and is, therefore, his prime trading capital.
8. Education develops but does not create mental force.

It is easy enough to say that the force produced by falling water or that produced by animals working in a treadmill is due to the action of gravity and that the force produced by the utilization of steam is due to the liberation and transformation of the energy which the sun long since stored up in coal or other fuel. But how much do we really know about it after all? What we really know the most about is not the origin of the force but what it will do under given conditions. If, then, we consider mental force as of unknown origin and are content, for the present, with observing its effects under given conditions, may we not by analogical reasoning

rob it of some of its mysteries and predict its behavior with somewhat reasonable certainty?

Measurement of Force

We have demonstrated above that mental force controls physical force, and we know that—

9. Physical force can be and now is measured by a compound unit composed of distance, weight and time, commonly known as a horsepower.

10. The amount of physical force which a normal man can generate daily is now known with some degree of certainty and is expressed in units known as man power, having a definite relation to a horsepower.

11. It is therefore possible to determine the amount of physical force which a man can physically control as well as that which he can generate.

12. Either of these may be the measure of a "fair day's work" according to conditions.

13. Until the units by which mental force can be measured are discovered we may measure it by the units of physical force controlled or directed by the mental force.

14. It should be possible to determine, on this basis, the amount of a fair day's mental work.

Apportionment of Physical Force

Let us now consider the use of physical force. We already determine, with a fair degree of certainty, the amount of force which must be imparted to the machine by its individual motor, and we regulate the size and capacity of the feed wires, cables, generator, engine, throttle valve, and boilers accordingly. We also determine the amount of coal, according to its richness in thermal units, which will be necessary as being, humanly speaking, the prime source of the desired force. The knowledge by which we are enabled to do these things has been obtained by specialists through study and experiment, and they have placed their discoveries at the disposal of all mankind. By such means we are enabled to determine either the number of machines which a given amount of coal will operate or the amount of coal and other things which are necessary to the operation of a given number of machines.

The physical force of the human body is comparable to the force of an inert machine; and while we have some information on the subject it is not as definite or as extensive as it should or might be. Hence the frequent and bitter strife between capital and labor over the amount of a "fair day's work." It is true that certain experiments have shown that a man power is about one-tenth of a horsepower, but what we sorely need is an exhaustive investigation into the relation which should exist between the periods of rest and relaxation for different volumes of load, in order that they may be so adjusted in the predetermination of industrial operations that the maximum of work may be obtained without exceeding the elastic limit of the worker any more than in the case of inert machinery.

The High Cost of Man Power

The reason why this investigation has been neglected is, perhaps, our monumental failure to grasp the tremendous excess of the cost of human over mechanical physical force. The large electric power companies will quote prices per kilowatt hour of from 10 cents per kilowatt hour for as little as 200 kilowatt hours per month down to 6 cents per kilowatt hour for as much as 3500 kilowatt

* Chief engineer, Universal Audit Company, New York.
† *The Iron Age*, January 26, 1911, page 248.

hours per month. And I have known current to be bought for as little as 2 cents per kilowatt hour in very large quantities. If a man power, as has been stated by a recognized engineering authority, is about one-tenth of a horsepower, then, on the basis that a horsepower is seven-eighths of a kilowatt, and that labor is paid 15 cents per hour, human physical force is from 16.5 to 82.5 times as expensive as electro-motive force—the force in each case being purchased from the generator.

Consider the elaborate investigations which are made into questions of mechanical and electrical engineering; the money and effort put into educational institutions for the education of the young along these lines; the struggle to produce mechanical refinements and power saving devices; the tests of coal and other fuels; the gauges for measuring the use of power—and then consider the great lack of consideration, along anything like parallel lines, of the economical use of human power, each unit of which costs so many more of our dear American dollars, which we are supposed to chase so madly.

The Waste of Skilled Man Power

In our employment of "unskilled" labor—the man who sweeps the street or office, the porter in the store or terminal, the roustabout in the factory yard or on the wharf—we are madly extravagant, but even more so in the case of skilled labor, which costs several times as much. And the consumer pays the bill. Yet the efficiency engineer, who has discovered this waste and is able and ready to remedy it, is the scorn and the jest of the average manager from Maine to Frisco; and even the laborer, who is more to be excused, not understanding the matter correctly, does not always recognize him as the friend he really is to all men. The most efficient way to utilize the physical strength of man is to employ it in the control of machinery by which the work is actually performed, rather than in the actual manipulation of the tool itself. The locomotive engineer, through his valves and levers, controls a far greater amount of force than he can personally generate, and in such cases any lack of efficiency is all the more manifest and deplorable.

Apportionment of Mental Force

Passing now to the control of the mental force, let us compare the mind of the worker to the individual motor on the machine tool; the foremen to the feed wires; the superintendents to the feed cables; the managers and vice-presidents to the generator and engine; the general manager to the engineer; the board of directors to the boilers, where the latent force of the stockholders, who in turn correspond to the coal, is collected and transformed. Is it not reasonable to take the ground that, in the transmission of this force, the same fundamental principles may be made applicable as in the handling of any other force? May we not measure the amount of mental force expended by the amount of physical force controlled, as in the case of the foremen; or the amount directed, as in the case of the higher official, who deals with sub-administrators only? Must we not secure proper proportions between the administrators and the demands upon them, as well as proper connections between them through which this force may flow? Must we not determine proper standards for their performances and obtain proper records of the results which they produce? Must we not adequately insulate the lines over which this force is transmitted and guard against cross-connections and short circuits, which tend to produce waste and confusion? And should we not also introduce intensifying forces at the proper points, even as oxygen is introduced into a flame with a blowpipe, in the shape of specialists who have special knowledge of certain subjects which can only be attained by long and special study? All these things would appear to be reasonable assumptions in the light of our experience with more tangible matters.

Production Only One Field of Application

From both the previous article and the foregoing it may have been erroneously inferred that this conception of administration as the science of the control of power, both mental and physical, is of value in connec-

tion with only one certain department of a business variously designated as the producing, operating or manufacturing department, and that the other departments—those concerned in selling, financing, &c.—are controlled along other lines.

This is one of two ideas which are tremendous stumbling blocks in the way of progress. In every line of effort it is the mental force of those who are behind the movement which not only energizes those at the head of the active operations, but is by them so transmitted and directed as to energize all whom they control or direct. This is the force that "gets things done." Money is not itself, as said above, any kind or type of force.

Co-ordinate Divisions of Business

The other idea which is a stumbling block is that one of the fundamental divisions of a business is superior to or inferior to another. Unless a logical and true balance is preserved among these the development of the business will be one-sided, resulting in maladministration. Many businesses are far less successful than they might be, because the manager has gained his experience largely in one or two divisions and thus has been unable to acquire a comprehensive grasp of the business as a whole.

We need men who are trained chiefly in the fundamentals of administration and supplementarily in the details of all of the divisions. It is only because administration has not been and as yet is not generally recognized as a science in itself that men have failed to recognize its dignity and importance; have been content with this one-sided training and have given the first place in their minds and attention to one of the subdivisions of a business rather than to the business as a whole. No man can be a good general manager because he is an exceptionally good financier, salesman or producer. If he gains eminence it will be in spite of this fact. It is the ability to surround oneself with able men in the different lines; to give directions as to what is desired in such a manner as properly to supplement the information at present possessed by the subordinates; to determine proper standards for performance; to secure proper records of achievements and to judge departmental results broadly and equitably from a comparison of these, that insures success.

The field of application of the science of administration, or the direct control of mental force, and through it of physical force, lies, therefore, in the direction of the business as a whole, and it must be so applied in order to secure the best results. If, then, we are dealing with a very real, if somewhat intangible, force and one which is amenable to much the same formulae as are other forces with which we deal more complacently, though we know but little more about them, may it not be possible that men who have made a long study of this subject are better able to devise effective means for the utilization of this force than those who have not approached the subject from this point of view? Is it not even more important that the control of this mighty force, over and above all lesser forces, should be intrusted to those men who have demonstrated, when dealing with other matters, their right to the title of engineer, who has been defined as one who "controls the forces of nature for the use and convenience of man"?

The Follansbee Brothers Company, Pittsburgh, Pa., manufacturer of polished and blue steel sheets, electrical sheets, tin plate, &c., will, on April 1, commence mailing to architects, sheet metal workers and those interested in building generally, a series of four-page pictorial descriptions of roofs on which Follansbee products were used. The series will be known as "The Tin Truth Bulletins of Good Tin Roofs," and will reach the architects semimonthly and the sheet metal workers monthly. The views shown will include residences, schools, churches, factories, depots, municipal buildings, warehouses, hotels, &c. Every sheet metal worker, roofer and architect desiring the series should write to the advertising department of the company requesting his name added to the mailing list.

Core Room Management and Materials*

Examples of Economies Due to a Study of Sand and Binder Problems

BY H. M. LANE.

In many cases by the proper selection of supplies and equipment a core room manager may more than cut core costs in half. Such savings as this can rarely be made in other departments of the foundry. An automobile concern sent patterns and core boxes for a cylinder to a foundry requesting an output of 30 odd cylinders per day. The cores and core boxes as designed were complicated, had many drawbacks and loose pieces, and were of heavy wooden construction. In order to get the job started, the management had to use these boxes at first, but it was necessary to work three gangs of core-makers for the entire 24 hours to get the proper number of cores from the boxes. The core boxes were redesigned and made in metal in such a way as to simplify the core arrangements. With the new boxes more cores could be turned out in one eight-hour day than were required for a day's molding. In fact, the capacity of the new boxes was so great that cores accumulated without forcing the workmen at all, and it is probable that nearly double the number of cores required per day could have been made by this equipment. The redesign of these boxes meant nearly six times the production per day from the equipment with the same amount of labor expended, and incidentally it may be stated that the resulting cores were cheaper, as there was no wax wire used in them and hence the finished core cost less.

A Saving in Binder

In another case an equipment man entered a foundry to look over the core room with the foundry manager. They were using rye flour as a binder and told him that they were mixing it at the ratio of 1 to 18. After watching the workmen for a little while he was convinced that they were using it much stronger, and asked them to weigh up the mixture for a day and find out what they were doing. This investigation showed that the workmen were actually using one part of flour to six parts of sand. On the amount they were consuming, they were wasting four barrels of rye flour a day, even with hand mixing. A mixing machine was installed and with this equally good cores so far as strength was concerned and very much superior as to venting quality, were made at a ratio of one part of flour to 36 of sand, which saved another four barrels of flour per day.

In another plant they were using \$115 worth of binder per day for mixing 80 tons of core sand. It required 12 men to do the hand mixing, and the following ratios were in use: Flour, 1 to 12; rosin, 1 to 12; oil, 1 to 40. For their work, after installing a sand mixing plant they doubled the ratio in all cases—that is they mixed the flour 1 to 24, rosin 1 to 24, and oil 1 to 80. By changing the brand of sand it is probable that they could have made a still greater showing.

Frequently it pays to have two or more brands of sand for different classes of work; for instance, a sharp silica sand or beach sand for oil sand cores and clay or loam sand for very heavy work, and a finer sand containing some clay for small work which must be smooth on the inside.

Another case was that of a steel foundry in which they had a \$2-a-day man in charge of the facing sand mill. They put a \$3-a-day man on the job and told him to use his head and stick to the right mixtures. From the start he saved them \$10 a day in binders.

If such savings as this can be made by better management in details, it stands to reason that corresponding savings can be made all along the line by more careful management of the core room. The effects of good core

room management are not seen in the core room alone, but in the foundry and machine shop as well. When cores are properly turned out the castings loss from bad cores should disappear, and in many plants this is a serious item. With properly made cores which clean out of the castings readily the machine shop will not be constantly complaining of dirt and hard scale in hollow castings, with their attendant bad effect upon tools.

The high grade core oils cost at present anywhere from 60 cents to \$1 a gallon, and it is evident that a comparatively small saving in the amount used will make a substantial showing on the right side of the cash balance. If a cheaper binder can be substituted for a part or all of the oil sand work it is evident that a greater saving can be effected, and there are many cases in which this can be done.

To resist heat we must use a material for cores which will not fuse at the temperature of molten metal, and which at the same time is capable in itself of resisting great pressure. Silicon in the form of sand has come to be universally recognized as the base of a core. The grains must be united with something which will be disintegrated by heat, and this has led to the universal use of some carbon compound; hence all core binders are carbon compounds, and most of them char or burn out at relatively low temperatures. The one exception to this binder rule is found in the use of the natural binder, clay, but where this is relied upon to any great extent the friability of the core must be insured by incorporating sawdust, coke, or some other material which will burn out and crush.

Green and Dry Binders

The binder must act not only after the core is dry, but must hold it in position during the drying, and prevent its sagging or deforming. George H. Wadsworth in discussing the core problem has referred to the green and the dry binders; that is, the binder which holds the sand in position while green and that which holds it after it is dried. For certain classes of machine made cores it has been found necessary to add some binder like flour to act as a green binder, while oil acts as the dry binder. In cores made on the jarring machine, or in many cases of hand-made cores, water forms the green binder, while the oil or compound forms the dry binder. In most cases the binder ratio can be cut down by working the mixture fairly wet, and frequently the driving of the moisture out of the sand seems to steam or carry the binder through the entire mass. In some cases it even concentrates it near the surface, giving a strong skin with a soft interior, which is frequently the most desirable arrangement.

Where cores are made up several days in advance of the time they are used and stored they have a tendency to absorb moisture; also in certain foundries it has been the practice to leave cores in damp molds over night or for a considerable number of hours. In this case the core must be able to resist moisture. It is commonly supposed that this practice necessitates a core made with oil, rosin or pitch (black compound) as a binder. A change in the core room management, however, with proper provision for taking care of and protecting cores may make it possible to use cheaper binders to advantage, and it is here that the management of the core room should co-operate with that of the foundry, and so arrange the practice as to permit the use of the cheapest efficient binder available. Some of the other binders, such as flour, dextrine, molasses or glutrin, possess special advantages over the more distinctly moisture resisting classes, and hence a wise management will provide

* Extracts from an address before the Buffalo Foundrymen's Association, February 28, 1911.

a dry place for storing stock cores and arrange to have the cores placed in the molds shortly before the molds are to be poured. This will frequently permit the use of much cheaper binders and the additional expense of keeping the cores in a dry place or of keeping them out of the mold until they are wanted is but a small part of the saving which may be effected.

Machine Mixing

Any compound can be mixed much better by machine than by hand. A splendid example of this came under the writer's observation some time ago. A certain foundry had had a great deal of trouble with its core department, and had changed foremen repeatedly. At last a man was put in who had a mind of his own. He asked for a batch mixer, which was promptly refused, the owner saying that one man had always mixed all of their core sand, and he saw no need of a batch mixer. The foreman immediately put five men to work mixing the sand for the cores which had been giving them trouble in the foundry, and he saw to it that they put in a faithful day's work, shoveling, tramping, and working the sand over and over. The trouble in the foundry disappeared as if by magic, and the castings all came good. The owner came to the foreman and asked what he had done. The foreman pointed to the five men industriously tramping and shoveling sand. The owner could not deny that with this mechanical work the results in the foundry were satisfactory. In the ensuing conversation the foreman managed to make it clear that one batch mixer with its rotating paddles would do as much work in a day on the sand as 150 men sweating profusely. As it was mechanical work that counted in this job, the owner at once came forward with the mixer.

Methods of Testing

The core room man should be capable of testing and comparing sands and binders. When purchasing the sand from the same company different shipments may vary so greatly as to upset all of the calculations in the core room. One firm keeps on hand a quantity of a standard brand of raw linseed oil to be used as a test for comparing either sands or other binders. Cores are made of sand, and this oil in the form of bars, 1 in. square by 15 in. long. If two sands are to be compared, an equal number of cores is made from the known and the unknown sand, while if it is binders that are to be compared a known sand is used and an equal number of cores made with each of the binders to be tested. The cores are then broken on supports 12 in. apart. It has been found that two batches of cores made from the standard linseed oil and baked under different oven temperatures may vary greatly in strength, but by baking a set of cores from the standard oil and a set of the unknown class on the same plate at the same time, a good comparison may always be obtained. By this means a working idea as to the value of either sands or binders can easily be obtained.

In many cases where intricate or delicate cores are required it is cheaper to purchase a clear washed silica sand than to use local bank sand. This is particularly true when oil is used as a binder. Cores made of oil and silica sand require few rods, as they are strong. For other classes of work, and particularly where a smooth surface is wanted, it is frequently advisable to use a little clay with the sand. In all cases, however, where cores that will vent freely are wanted care should be taken to avoid the presence of any fine material in the core which does not partake of the nature of a bond. In most cases in purchasing core sand freight is the largest item, and frequently the removal of the burnt sand from the foundry is also an expensive item; hence for economy's sake the foundryman must get as much life or use from the sand while it is on hand as possible. In carrying out this idea water barrels or washing devices have been perfected and are used successfully for removing fine dust from the sand, and thus permitting the re-use of the coarser particles. This sand washing costs but little and gives superior product for making cores for many classes of work.

Core Sand Storage

The storage of core sand is an important item. Where possible it should be stored under shelter, and it should contain as small an amount of moisture as possible previous to mixing. Serious irregularities in core room practice are frequently traceable to variations in the amount of moisture in the sand, as it comes to the mixer, no account usually being taken of this original content of sand. Where sand is used in considerable quantity provision should be made for handling it economically. At the plant of the Bettendorf Axle Company in Bettendorf, Iowa, large concrete bins have been installed. These are under shelter and room is provided for a siding that will hold four flat cars inside of the building, so that four cars of sand can be put in at the same time and unloaded by an electric crane and a grab bucket. As sand in the winter may frequently be received containing moisture, provision has been made for heating the bins at the bottom. In the division walls between the bins are passages containing steam pipes, the divisions between the bins are of steel plates in place of concrete, and it has been found in practice that the heat from these steam pipes slowly passes through the sand mass, thawing the frozen material and keeping the sand in good condition.

At the plant of Baxter D. Whitney & Co. of Winchendon, Mass., where a much smaller amount of sand is used, this being a foundry auxiliary to a manufacturing concern, the bins are in a basement or lower floor, and the runway extends from the railroad track on top of the bins, so that the sand may be wheeled in wheelbarrows and dumped through hatches in the roof of the sand storage. In this case, as should be the case with all small foundries, the year's supply of sand is put in during the summer, when there is no frost. With very large plants this is not always possible. If a blend is being used which requires clay and comparatively small quantities are being handled the clay can be added in the form of clay wash to the batch mixer or to the material mixed by hand. Any foundryman melting over 5 tons of iron per day can afford a batch mixer, and would find it an excellent investment for preparing both core sand and facing sand.

Core Drying

For the drying of cores an efficient oven is necessary. The temperature should be uniform throughout the oven, and the length of time necessary to dry any given core will necessarily depend to a considerable extent upon the bulk or volume to be considered. First the water which is used with the binder must be expelled. This passes off as steam, and ample provision must be made for its exit from the core oven. After the moisture has been removed there is a chemical or mechanical action which goes on in the binder, according to the binder employed. Flour or dextrine must be baked just as bread or pie crust is baked. Oil like linseed oil must be oxidized and dried down to an adhesive skin. Black compound and rosin must be melted and caused to flow through the sand, and any volatile constituents driven off. Molasses must have its excess water driven off and be charred. Glutrin must have the excess water expelled and the material reduced to a solid consistency.

The temperatures required for drying different cores vary greatly, and the same binder treated under different temperatures has different properties. For instance, a core made with pure linseed oil will harden sufficiently for use in the air if given time enough. This is on account of the fact that the oil is slowly oxidized just as linseed oil hardens in an ordinary paint. Ordinary core oils, however, contain other constituents which have to be volatilized and driven out, and for this purpose a comparatively high temperature is necessary. Like oil a glutrin core will harden in the air if exposed in a dry place, but the material is hygroscopic and takes up moisture again if exposed in a damp place. If glutrin is baked at such a temperature that some of the constituents are charred it attains considerable moisture resisting properties, and it is right here that the success or failure with many plants with the use of this binder

has occurred, the trouble being with the temperature obtainable in the core oven used.

In many foundries everything is sacrificed to rapid drying. The writer visited a foundry recently where they were using flour for most of their cores. The ovens were driven with coke fires directly beneath the cores, and frequently the core pans at the lower part of the oven when removed would be red hot around the edges and the cores smoking like a house afire. Upon breaking the cores open as they came from the oven the interior of the larger ones was found to be green or doughy. Many of them were baked in 10 minutes or less. On account of this oven practice it was necessary to use about three times as much binder as would have served had a slower baking been practiced. In another foundry using glutrin the cores were hurried through the oven so fast that the interior was still moist. As the metal poured in this case was brass, and as the cores remained in the mold but a few minutes before pouring, no bad results followed, but had this been an iron foundry and the cores left in the mold several hours, there would have been serious softening of the exterior portion of the core from the large amount of moisture remaining inside the core.

Unfilled Orders of the Steel Corporation

Another increase in unfilled orders is shown by the statement of the United States Steel Corporation published March 10. It amounts to 289,624 tons for February, against 436,162 tons increase in January, which was the first interruption to a 12 months series of decreases. The figures below compare the February 28 statement of unfilled tonnage with those issued monthly since the middle of 1910 and with the quarterly statements beginning with December 31, 1908:

February 28, 1911...	289,624	June 30, 1910.....	4,257,794
January 31, 1911...	3,110,919	March 31, 1910.....	5,402,514
December 31, 1910..	2,674,757	December 31, 1909..	5,927,031
November 30, 1910..	2,760,413	September 30, 1909..	4,796,833
October 31, 1910....	2,871,949	June 30, 1909.....	4,057,939
September 30, 1910..	3,158,106	March 31, 1909.....	3,542,595
August 31, 1910....	3,537,128	December 31, 1908..	3,603,527
July 31, 1910.....	3,970,931		

The unfilled orders at the close of the years preceding 1908 were as follows: 1907, 4,624,552 net tons; 1906, 8,489,718 tons; 1905, 7,605,086 tons; 1904, 4,696,203 tons; 1903, 3,215,123 tons; 1902, 5,347,523 tons.

It is stated in connection with the February figures just published that the shipments in February were at a rate considerably in excess of those for January, so that the rate at which new business came in last month represents a substantial increase over January.

Worcester Metal Trades Annual Meeting.—The Worcester Branch National Metal Trades Association held its annual business meeting March 9, and elected these officers: President, Albert E. Newton, Prentice Bros. Company, Worcester, Mass.; vice-president John W. Higgins, Worcester Pressed Steel Company, Worcester; treasurer, A. W. Beaman, Stockbridge Machine Company, Worcester; members of the Executive Board for two years, Alonzo W. Whitcomb, Whitcomb-Blaisdell Machine Tool Company, Worcester; H. B. McDonald, Simonds Mfg. Company, Finchburg, Mass.; Frank H. Orr, Dupaul-Young Optical Company, Southbridge, Mass. The members of the board whose terms hold over are George F. Brooks, Harrington & Richardson Arms Company; Clarence W. Hobbs, Hobbs Mfg. Company, and George I. Aiden, Norton Grinding Company, all of Worcester. The reports of the officers showed that the year has been a prosperous one in the affairs of the branch.

The Parkersburg Iron & Steel Company, Parkersburg, W. Va., manufacturer of sheets, has declared an annual dividend of 5 per cent. Officers have been re-elected as follows: C. F. Niemann, president and treasurer; A. E. Niemann, vice-president; A. H. Gelfuss, secretary; C. A. Orr, auditor; John Stephens, general superintendent.

February Copper Production and Stocks

The Copper Producers' Association has issued its monthly statement for February. It shows an increase of 14,198,280 lb. in stocks. Following is the statement:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States February 1.....	142,439,490
Production of marketable copper in the United States from all domestic and foreign sources during February	109,828,297
Deliveries of marketable copper during February:	
For domestic consumption.....	50,518,998
For export.....	45,111,019
Total.....	95,630,017
Stock of marketable copper of all kinds on hand at all points in the United States March 1.....	156,637,770

The association has also issued the following explanation of the disagreement between its export figures and those of the United States Bureau of Statistics, which has caused much comment among students of statistics:

"The exports of copper from the United States for the calendar year 1910 as reported by the Government and by the Copper Producers' Association were as follows:

	Pounds.
Government	695,162,900
Copper Producers' Association.....	722,431,494
Difference.....	27,268,594

"Of this difference of nearly 4 per cent., the Copper Producers' Association began early in December an exhaustive investigation. It comprised a critical review of the data on which the producers' reports were based, and a detailed comparison of these data with the original records in the custom houses at New York and Baltimore, which two ports cleared nearly 98 per cent. of all copper exported in 1910.

"This investigation, which has just been completed, confirms the accuracy of the statistics issued by the Copper Producers' Association. The chief cause of disparity is a time difference in the two sets of reports. The Copper Producers' Association reports the copper exported as soon as it is loaded on the lighters that are to transfer it to the steamships, whereas the customs authorities do not consider the copper exported till the ship is cleared through the port. Furthermore, the New York Custom House observes a fiscal month, whereby all the clearances of the last four business days of any calendar month are included in the month following. It results, therefore, that for nearly 70 per cent. of all copper exported there is an average difference in time of reporting of from 8 to 11 days, and for the remaining 30 per cent. a difference of 4 to 6 days. This time difference at the two ports, New York and Baltimore, accounts for the amount shown below:

	Pounds.
Total difference.....	27,268,594
Amount explained by difference in time.....	17,902,306
Remaining difference to be explained.....	9,366,288

"The remaining discrepancy of over 9,000,000 lb. has also been satisfactorily accounted for, but the explanation of this may best be reserved till the receipt of findings from the Government officials, who are now investigating the matter."

The Vulcan Mfg. Company, Fond du Lac, Wis., has been incorporated with \$30,000 capital stock. The new company has purchased the property in Fond du Lac known as the blast furnace property and is making extensive improvements preparatory to the installation of new equipment for the fabrication of structural iron and steel, steel bridges, boilers, &c. It will also build the steel centering for the Adjustable Steel Centering Company, a number of whose stockholders are interested in the new company.

The Diamond Iron Works, Minneapolis, Minn., states that it has recently increased its capacity 50 per cent. and has added to its line of sawmill machinery the building of gasoline tractor engines and stationary gas engines.

Obermann Acid Fume Removing Devices

A. W. Obermann, president of the American Specialty Stamping Company, Johnstown, Pa., is the inventor of devices for confining and removing fumes in plants where acid is employed for cleaning or plating metals. Two forms of apparatus have been designed: one for use with acid tanks located above the floor line, and the

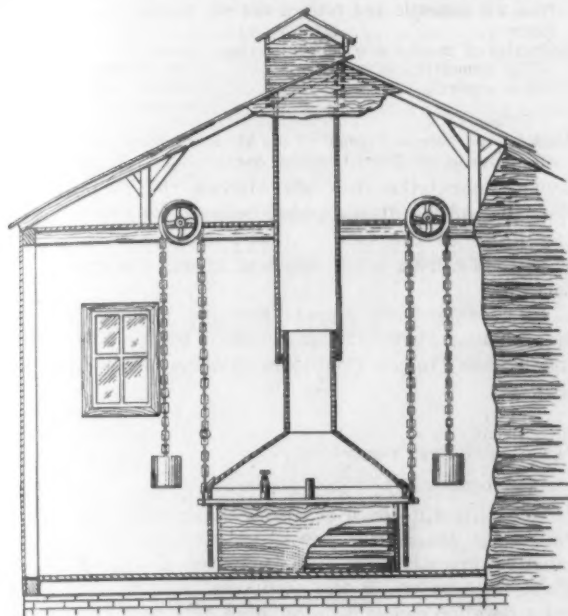


Fig. 1.—A Fume Removing Ventilator for Acid Tanks Located Above the Floor Line Patented by A. W. Obermann, Johnstown, Pa.

other where the tanks are below the floor. Fig. 1 is a view of one of the former type, while Fig. 2 shows a large installation of the other style at the plant of the American Specialty Stamping Company.

When the acid tank is located above the floor line a hood is suspended over it by chains on each side, to which counter weights are fastened, so that the hood may be easily raised when materials are to be placed in the tank to be pickled or are to be removed. The movable hood has a stack telescoping in a fixed chimney leading through the roof. The natural draft created under the hood and through the openings between the telescoping sections and in the slatted upper part is generally sufficient to carry the fumes away from the tanks and discharge them to the outside air, but a steam jet is also provided to give artificial draft when needed so that there is no chance of injury coming to the workmen from escaping fumes. A further advantage is that

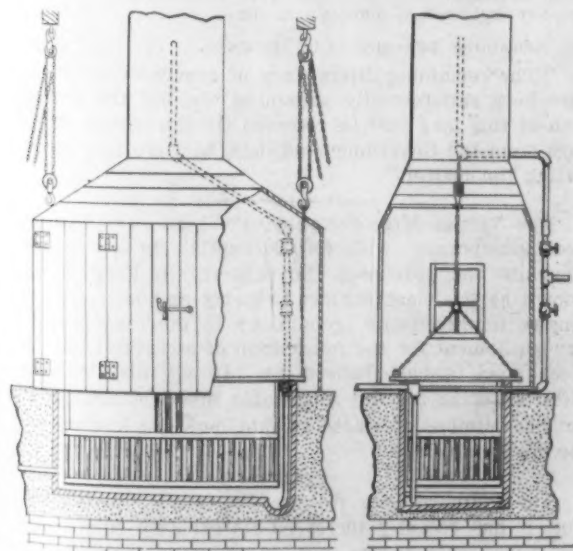


Fig. 2.—The Obermann Fume Removing Apparatus as Applied to an Acid Tank Set Below the Floor Level.

the room where the pickling is done is kept free from mist, &c. Incidentally more and better work is done by the men working under such improved conditions. The tank is so constructed as to eliminate chance of leakage, and thus effects a considerable saving in acid, which ordinarily is a dead loss.

In the larger installation, with the tank below the floor line, shown in Fig. 2, doors are located at the front of the hood to permit access to the tank, instead of lifting the hood. The crate for holding the materials to be cleaned is raised and lowered on pulleys. In this case the acid fumes are discharged immediately to the outer air, and if the atmospheric conditions are not favorable the draft is augmented by injecting steam through a pipe provided for this purpose, so as to force the fumes out. This system has been used in the plant of the American Specialty Stamping Company for several years with such success that the inventor applied for patents; one on the apparatus shown in Fig. 1 was granted October 5, 1909, and one on that shown in Fig. 2, June 21, 1910.

European Methods of Accident Prevention and Relief

The March issue of *American Industries*, published by the National Association of Manufacturers, 30 Church street, New York, announces that the association will soon issue a volume giving the results of investigations of accident prevention and relief methods in Europe by Ferd. C. Schwedtman and James A. Emery, who were appointed a commission for that purpose by President John Kirby, Jr., under resolutions passed at the last annual convention of the association held in May, 1910. The commissioners selected were ideal men for the task. Mr. Schwedtman has had long experience as a civil and mechanical engineer and manufacturer, while Mr. Emery has devoted the greater part of his life to the study and practice of industrial law, and both brought enthusiasm and a deep earnestness to the task of investigation.

The book is described as profusely illustrated with colored charts and diagrams and is giving exhaustive descriptions of accident prevention and relief methods in England, Germany and several other countries, while a most important section gives recommendations for action in the United States. It has an appendix of statistical and general material. The testimony of the more than 30 members of the association's Advisory Committee, composed of manufacturers of note from various parts of the country, is unanimous in approval of the book, which is characterized as the most helpful and practical work of its kind yet undertaken. The plan of the association is to afford all classes an opportunity intelligently to readjust existing conditions to the end that industrial accidents will be reduced to a minimum and the injured or incapacitated given the maximum relief for every dollar expended for that purpose.

The Reliance Electric & Engineering Company announces its removal to its new offices and shops on Ivanhoe road, Collinwood Station, Cleveland, Ohio. The new plant is of reinforced concrete construction with saw tooth roof, and particular attention has been paid to arrangement, lighting and all other features which tend to manufacturing efficiency. It gives the company double its former capacity, thereby enabling much better service to be rendered to customers. A circular is issued showing a graphic record of progress in the demand for Reliance motors. The growth in the past four years is striking, the shipments for 1910 being five times as great as those of 1907. The company is prepared to manufacture all brackets, gears, etc., for changing machines from belt to motor drives. Recent orders received by the company include contracts by the A. M. Byers Company, Pittsburgh, and the Wheeling Steel & Iron Company, Wheeling, W. Va., for adjustable speed motor equipment ranging from $7\frac{1}{2}$ to 15 hp., for changing a number of machines in their pipe mills from belt to motor drive.

The Cambria Boiler Shop and Dipping Tank

Interesting Problems Solved in the Manufacture of Asphaltum Covered Steel Plate Water Pipe for the Cambria Steel Company's Private Water System

The Cambria Steel Company, Johnstown, Pa., is creating great hydraulic works to insure a supply of water capable of meeting the enormous needs of the plant at all seasons of the year. At present about 80,000,000 gal. are required daily, and although the existing sources of private supply are large, the river water must be used over and over again. It passes through the Franklin Works first, then the Gautier and finally the Cambria Plant, and large pumping stations are main-

pipe in position above the stove, a dipped pipe just removed from the tank and at the lower left corner a pair of pipes loaded on a flat car ready for transporting to the field. Figs. 3 and 4 are a plan view and a transverse section of the boiler shop and the dipping plant respectively. In Fig. 5, a section of the pipe 30 ft. long is being riveted by the 17-ft. vertical gap riveter. Figs. 6 and 8 give details of the stove employed to heat the pipe before dipping and of the dipping tank and the bustle pipe re-

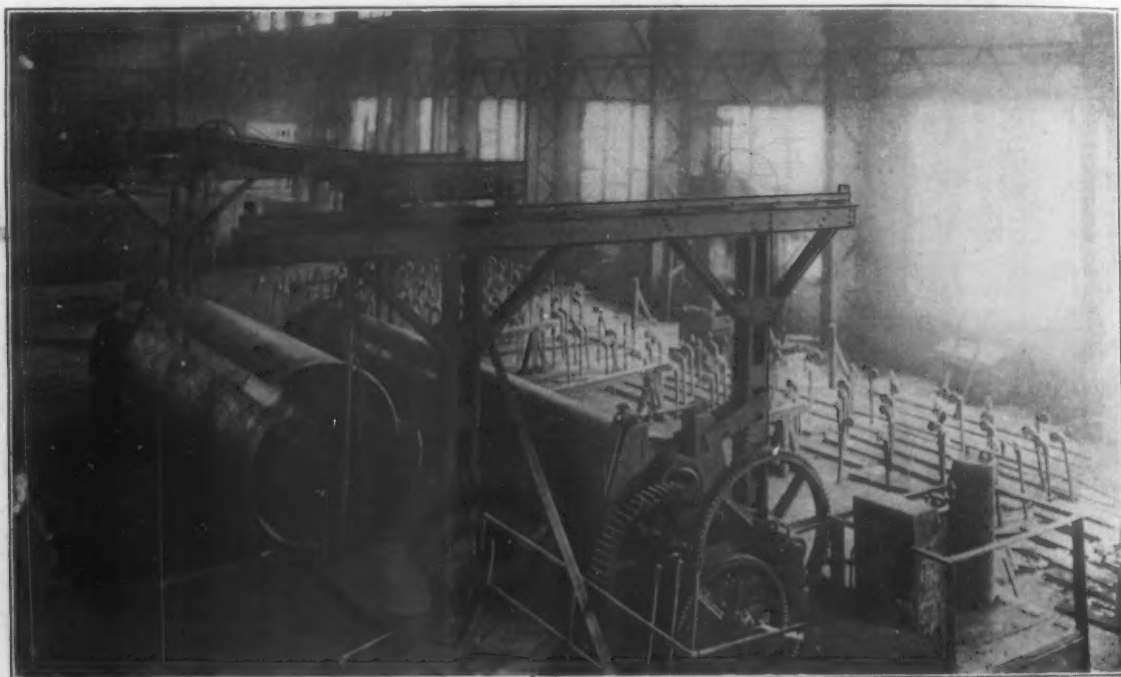


Fig. 1.—The 32-Ft. Horizontal Bending Rolls Installed in the Boiler Shop of the Cambria Steel Company, Johnstown, Pa.

tained to supply the various plants. Due to growth of the business, it has now become necessary to procure a much larger supply, and to this end a reservoir having a capacity of 11,000,000,000 gal. is being created on Quemahoning Creek at a point about 14 miles from the works. A 66-in. pipe line, which must carry 90,000,000 gal. a day, connects the reservoir with the works. The water is under a heavy head for a considerable portion of the distance, and the pipe line is remarkable in many respects, not the least of which is the nature of the pipe itself. As the line passes through an exceedingly hilly country, its various parts are at widely varying levels, although extreme differences are avoided by tunneling the four most pronounced elevations along its route.

After carefully studying the question, the company decided to manufacture the pipe in its own works from boiler plate rolled in its mills, and the capacity of the boiler shop was largely increased, including much new equipment. Some means of protecting the pipe against corrosion had to be developed and a dipping plant for covering the steel with a special asphaltum was constructed and an efficient method of applying it evolved. Much of this pipe has now been made. During its production perplexing questions have arisen and been solved, until, in the Cambria plant, a highly specialized process has been developed and will be turned to commercial account, the company proposing to enter the market with the highest grades of water pipes and with other specialties manufactured in the boiler shop.

Fig. 1 is a view of the 32-ft. horizontal bending rolls installed in the boiler shop for forming the pipe. Fig. 2 shows a portion of the dipping plant and an undipped

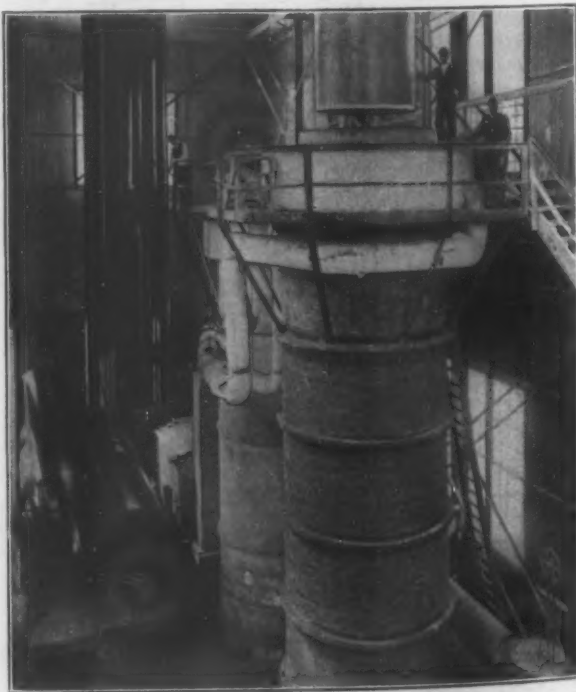
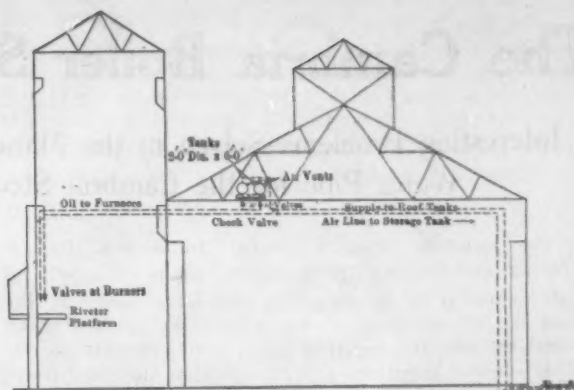
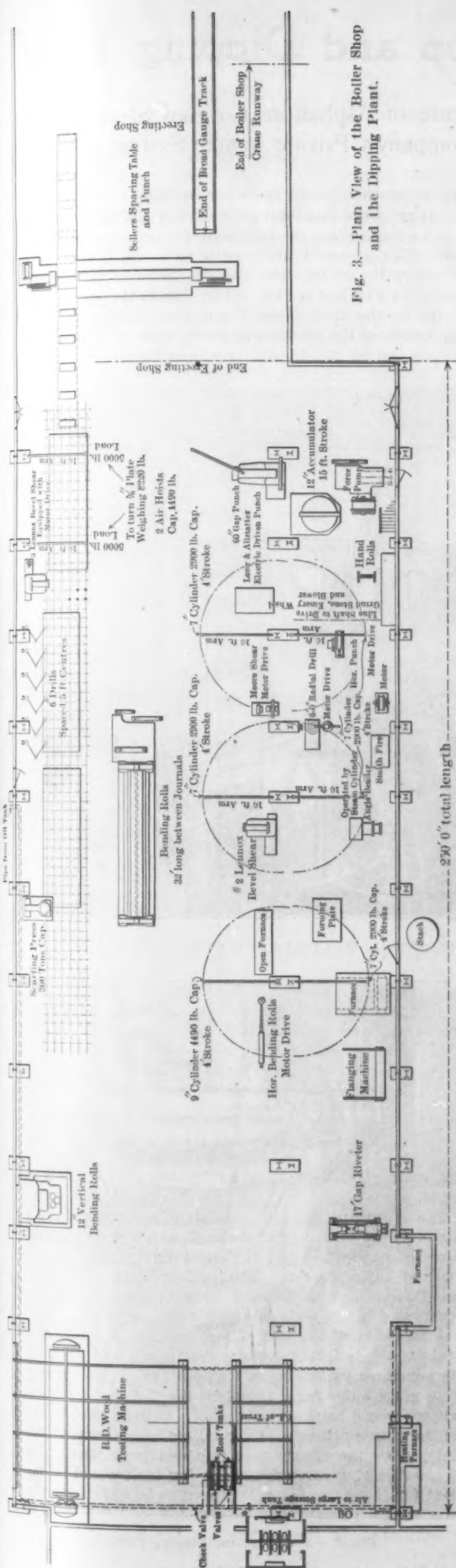


Fig. 2.—A View in the Dipping Plant.

spectively. Fig. 7 is a section of the dipping tank showing its construction.



Manufacturing the Pipe

The layout of the boiler shop is shown in detail in Fig. 3. The plates are taken from flat cars to the Sellers spacing table and punch, at the upper left corner of the engraving, and thence pass down the shop, undergoing the various operations of punching, counter-sinking and scarfing, to the 32-ft. bending rolls, illustrated in Fig. 1, which form them, each as a 120-degree section of the pipe. The pipe is assembled at this point, its sections

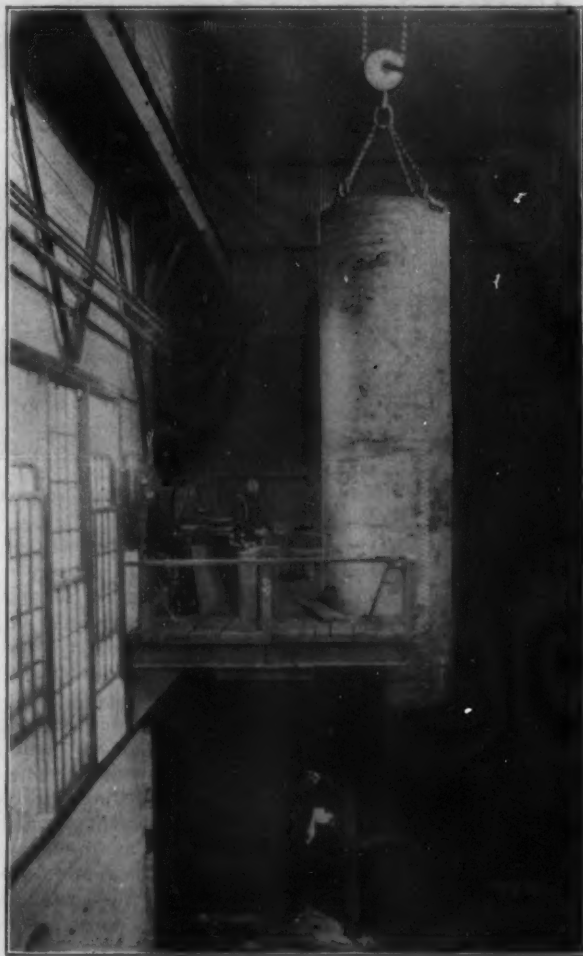


Fig. 5.—Riveting a 30-Ft. Section of Pipe.

being bolted together temporarily for conveying by a travelling crane to the 17-ft. vertical gap riveter, shown in Fig. 5. One-half of the section is riveted, and its position is then reversed, end on end, for riveting the other half. The pipe then goes to the caulking machine, and upon completion is subjected to severe hydraulic tests. The 5-16-in. pipe is tested at 135 lb., the $\frac{3}{8}$ -in. at 160 lb., the 7-16-in. at 190 lb., the $\frac{1}{2}$ -in. at 220 lb. and the $\frac{5}{8}$ -in. at 290 lb. These may be termed preliminary tests, as in the field long sections of the line of laid pipe are cut off and subjected to high pressures, so that any leaks which may develop at circumferential seams or elsewhere may be repaired.

The pipe is manufactured in lengths measuring 30 ft. between rivet centers. There are no circumferential seams, except those riveted in the field. The pipe thickness varies from 5-16 to $\frac{5}{8}$ in., according to the head of water to which it is subjected. Each section of the $\frac{5}{8}$ -in. pipe weighs seven tons. One important problem to be

raised by a hoist and lowered at an angle until the uppermost point of the end enters the pipe in the ground at its corresponding point. A bolt is then inserted and constitutes a fulcrum, so that the pipe, as it is lowered, forces itself into position by its own weight. Pneumatic riveters and caulkers complete the joint.

The building occupied by the dipping department, a section of which is shown at the left of Fig. 4, is of unusual design. Great height was necessary because the stove and the dipping tank are upright, and there must be space above them in which to lift the 30-ft. sections when placing them in these receptacles. Another reason for the design of the building is its location, which is in a narrow space between railroad tracks on the one side and the boiler shop on the other. From the ground level to the bottom of the lower chord of the roof is 76 ft., the width of the building is 32 ft. and its length 90 ft.

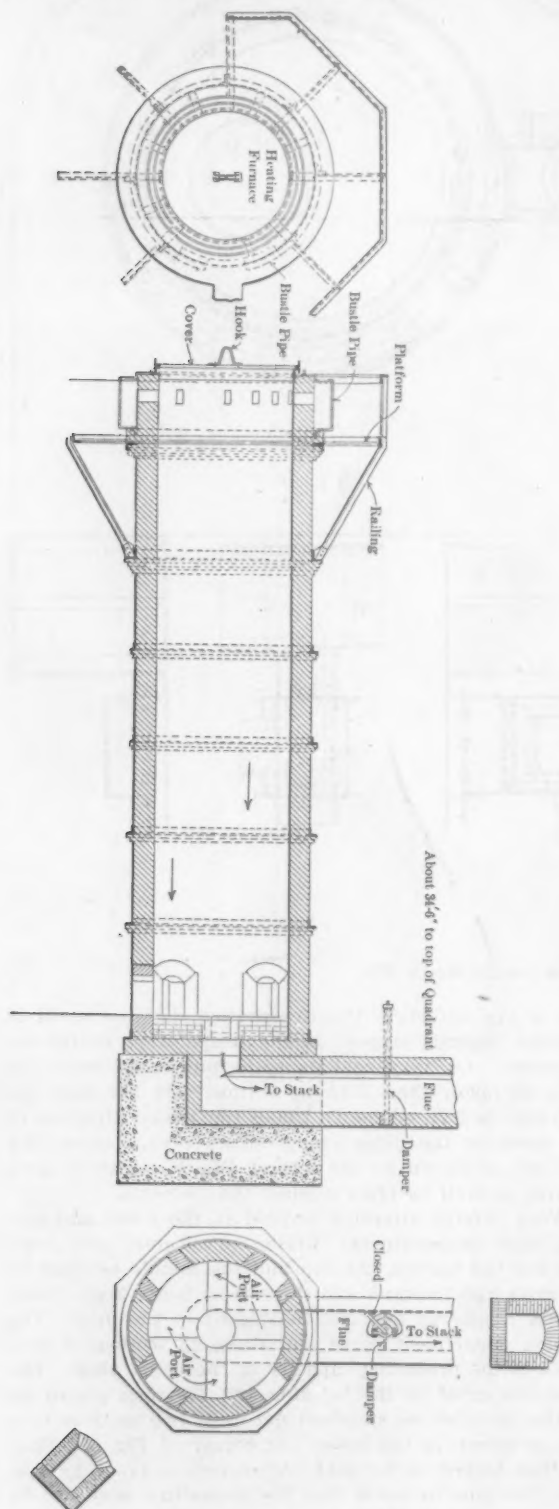


Fig. 6.—Details of the Stove.

solved was that of skin friction. Owing to the long distance from the source of water supply to the works, increasing the diameter of the pipe meant a large additional outlay of money. The only material friction occurs at the seams, particularly from the rivet heads, and this is practically eliminated by countersinking the rivet holes, so that the heads are practically flush with the interior pipe surface.

In the field the method of laying the pipe insures a tight fit at the joints. Each section is formed with a taper, so that the smaller end of one pipe enters the larger end of its neighbor. Each section as it is laid is

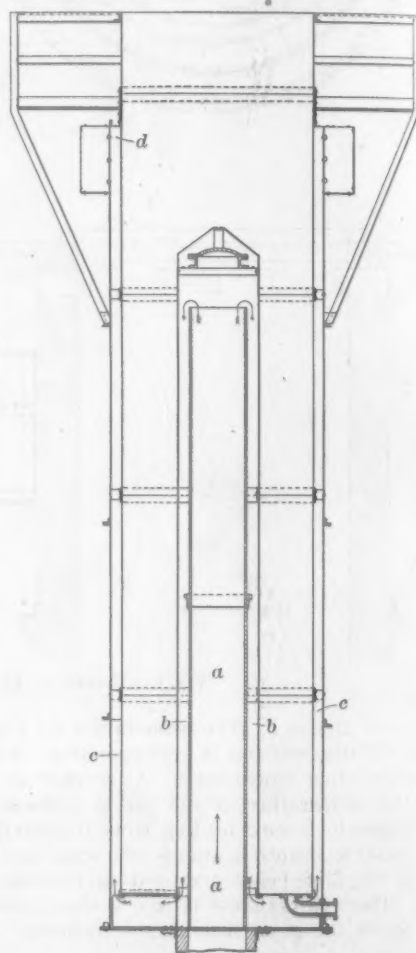


Fig. 7.—Section of the Dipping Tank.

The entire width is spanned by two 10-ton Alliance cranes.

The apparatus installed consists of a stove and a dipping tank, the former to heat the pipe to a proper temperature before dipping, and the latter for its immersion in a bath of hot asphaltum. The heating is accomplished by coke furnaces. The common practice has been to use superheated steam coils in keeping the asphaltum warm. This necessitated the use of two heaters, in order that it might be absolutely certain that one would be available continuously, giving a temperature of 700 degrees. The engineers designing the plant decided that coke-fired furnaces would be more satisfactory and the results have justified this conclusion. Originally a single furnace was employed on the theory that the heat remaining in the gas after passing through the dipping tank would be sufficient for the stove, but this proved to be unsatisfactory, and a second furnace was constructed, which is used as an auxiliary. In the melting pot the heat of the furnace enters at the bottom of a central drum at *a*, Fig. 7, having a double wall, and passes down between the walls at *b* and up again through the outside jacket *c*, exhaust-

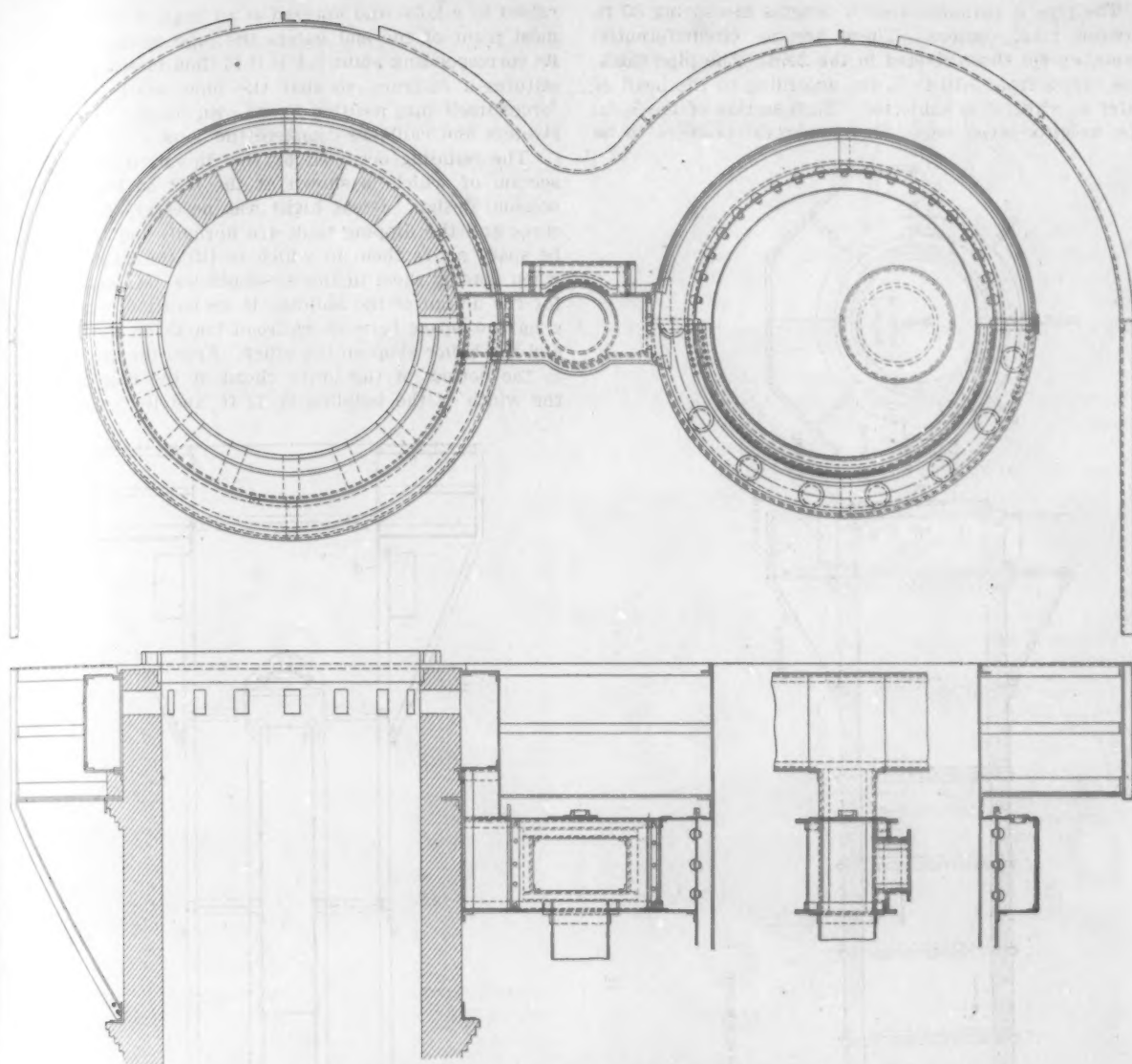


Fig. 8.—Details of the Dipping Tank and the Bustle Pipe.

ing into the bustle pipe at *d*. The temperature for 7-16-in. pipe is about 420 degrees, and is correspondingly higher or lower for the other thicknesses. After entering the bustle pipe, the temperature of the gas is increased to the desired degree by a pipe leading from the auxiliary furnace. A mixer operates in connection with the heat supply a cold air pipe being arranged to regulate the temperature. The final exhaust is into a stack, and an exhaust fan draws the gases through the furnaces.

Coating the Pipe

When the pipe is received from the boiler shop it is first carefully cleaned. In the field the asphaltum is removed from the outside of the small end and the inside of the large end of the pipe, where the joint is to be made. Consequently before dipping, these portions of the pipe surface are covered with whitewash, which allows the asphaltum to be easily peeled off. On each end of the pipe are bolted two lugs, each having a 3-in. hole to receive the crane hooks.

The pipe having been cleaned and otherwise prepared is lifted by the crane and lowered into the oven, which has an iron cover manipulated by a jib crane and a chain hoist, the dipping tank having a similar arrangement. An undipped pipe is shown suspended above the stove at the right of Fig. 2, while a dipped pipe is hanging at the left. After the pipe has been heated the cover is removed and it is lifted and carried to the melting pot into which it is dropped. It remains immersed for about 4 min. The department had to learn much from experience, for there was little precedent to assist it. It was found that the pipe must be withdrawn very slowly from the melting pot, as to hoist it quickly meant that the slowly draining asphaltum accumulated thickness until at the lower end of the pipe there was a great ex-

cess of the material. Practice showed that the speed of removal depends largely on the temperature of the atmosphere. On very cold days the pipe must leave the tank no faster than 2 in. at a time. On hot days the rate may be 2 ft. or more. Under the skilled direction of the operator the pipes are given an even, varnish-like coating, as shown at the left of Fig. 2, which is good looking as well as proof against the elements.

Very careful attention is paid to the stove and dipping tank temperatures. Bristol pyrometers give readings for the bottom, the top and the middle sections of the stove and the tank and these records are kept. Each pipe is numbered and may be traced in the field. The dipping department turns out about 23 sections a day, which is the producing capacity of the boiler shop. The pipes are dried in the building and are then placed on cradles mounted on standard flat cars, two sections to a car, as shown in the lower left corner of Fig. 2. They are then hauled to the field. Much care is taken in handling the pipe in order that the asphaltum may not be seriously marred. Where such accidents occur, a special preparation is applied to the surface and this is also used at the circumferential joints to further insure their watertight properties and more particularly to guard against corrosion.

The Association of German Iron Foundries is offering prizes of \$250, \$125 and \$75, respectively, for the three best essays on the development of the cast iron stove. The questions to be considered are the means of using cast iron stoves in heating systems from economical, hygienic and commercial standpoints, with suggestions for increasing the use of such stoves. The manuscripts are to be addressed to the Verein Deutscher Eisen-giessereien, Graf-Adolphstrasse 47, Düsseldorf 3, Germany.

The Smith Metal Perforating Process

A Means of Puncturing Narrow Slots in Thick Metal—Originally Developed for Well Casing

After several ingenious attempts to improve on the ordinary well casing, each successful in its way, but still failing to overcome all objections to the older type, Andrew Smith, San Mateo, Cal., has finally developed what proves to be an entirely new process for perforating metal. The disadvantages of the old style cracked casing, which has been used for more than 30 years, are that if the perforations are made before the casing is driven the protuberances produced on the outside make it difficult to drive the casing, and when made after the casing is driven, by means of a wheel perforator, hydraulic jacks or other tools, there are still the objections that the perforations are irregular in size of opening, jagged at the cracks, not closely enough spaced to give a desirable total inlet area and, being perforated after galvanizing, the broken edges exposed the iron at those points to corrosion. There is also more tendency for these slits to be clogged with the outlying material carried into them by the water.

Fig. 1 shows a section of metal perforated by the old process. Both sides are shown indicating the nature of

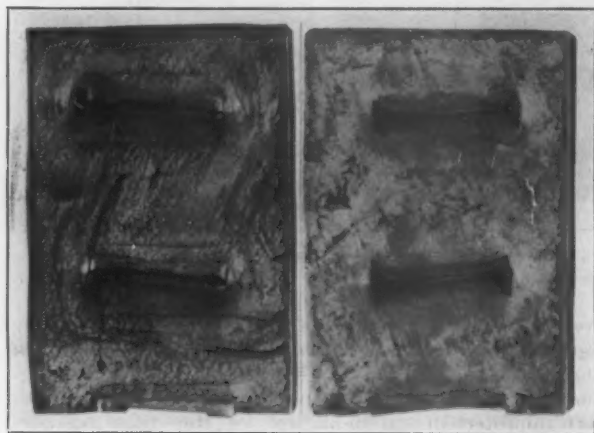


Fig. 1.—The Outside and Inside of a Section of Well Casing with the Ordinary Cracked Perforations.

the deformation. Up to the present it is the only casing that has been used in sandy formations. It is made from galvanized sheet steel of No. 16 to No. 10 gauge and from 8 to 18 in. diameter. The joints are 30 in. long, riveted together, using 8-in. collars to join one length to another. The collars, every 30 in. apart, offer considerable resistance, and the rivets have a tendency to fall out.

Fig. 2 is a sample of the first improvement for well casings, patented by Mr. Smith, in which he followed the established rule that a punched slot must be as wide as the thickness of the metal. To obtain fine slots two perforated tubes were used, one inside of the other, and the openings were staggered; the annular space between the tubes (or, in the sample, the amount the plates are separated) determines the width of the openings. The second improvement, shown at the left in Fig. 3, was somewhat similar, consisting of two tubes again, but the separation was dispensed with and the width of opening was made adjustable by turning one tube with reference to the other to give any required overlap of the holes. An advantage that is obtained with this well casing is that sections at different depths can be given different sized openings according to the soil penetrated. For example, at the bottom where possibly coarse gravel would be encountered, the openings can be made relatively large, while those in sections above, going through fine gravel or sand, can be more nearly closed, and throughout the casing the greatest amount of allowable opening will be obtained.

The first attempt to get the required width of slot in a single pipe was that shown by the sample at the right in Fig. 3, which is of a piece of No. 10 sheet steel.

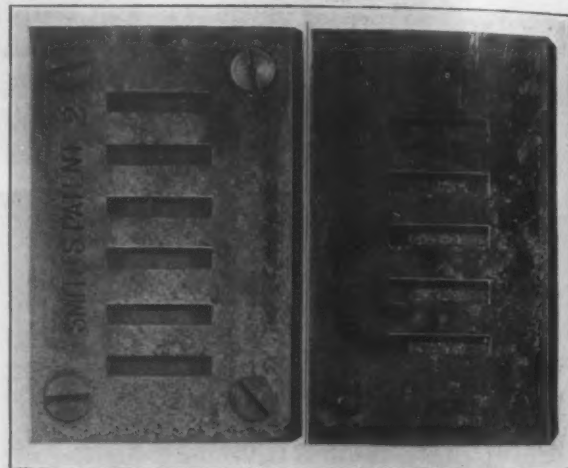


Fig. 2.—Views of Both Sides of a Section of Double Wall Casing with Staggered Perforations, and a Slight Space Between Plates to Give the Screening Apertures.

It has a clean cut shear and one edge is depressed a little more than the thickness of the metal, thus forming an opening that is not jagged like the old style cracked perforation, but the deformation does increase the driving resistance. There are many uses to which this style of perforated metal can be put, however, one of which is its use as a reinforcing inner pipe for well casing as referred to later and shown at B in Fig. 6.

The Perforating Process

It was but a step from the last named process to produce perforations after the manner indicated in sample 5, Fig. 4. This is a piece of No. 10 sheet steel with a clear cut shear produced by depressing alternating sec-

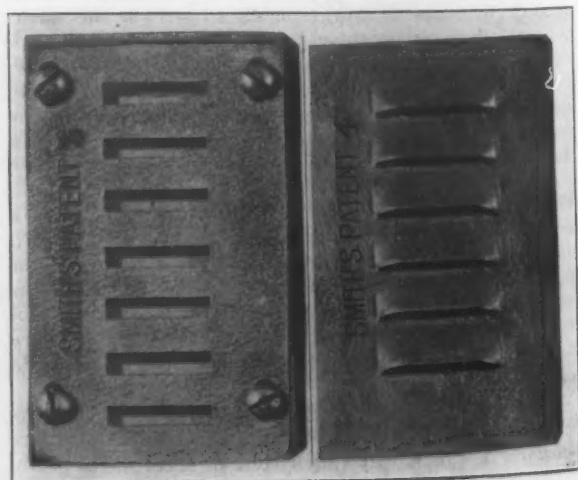


Fig. 3.—Another Double Wall Casing with the Screening Apertures Determined by the Amount of Offset of the Perforations and the First Attempt to Get Narrow Slots in a Single Casing.

tions of the metal in opposite directions. In this condition the protruded portions can be cut again or upset to make any desired size opening, or the uncut portions can be rolled so as to stretch the metal and so make the openings. Herein lies the most ingenious part of this new process of perforating metal. The perforating can

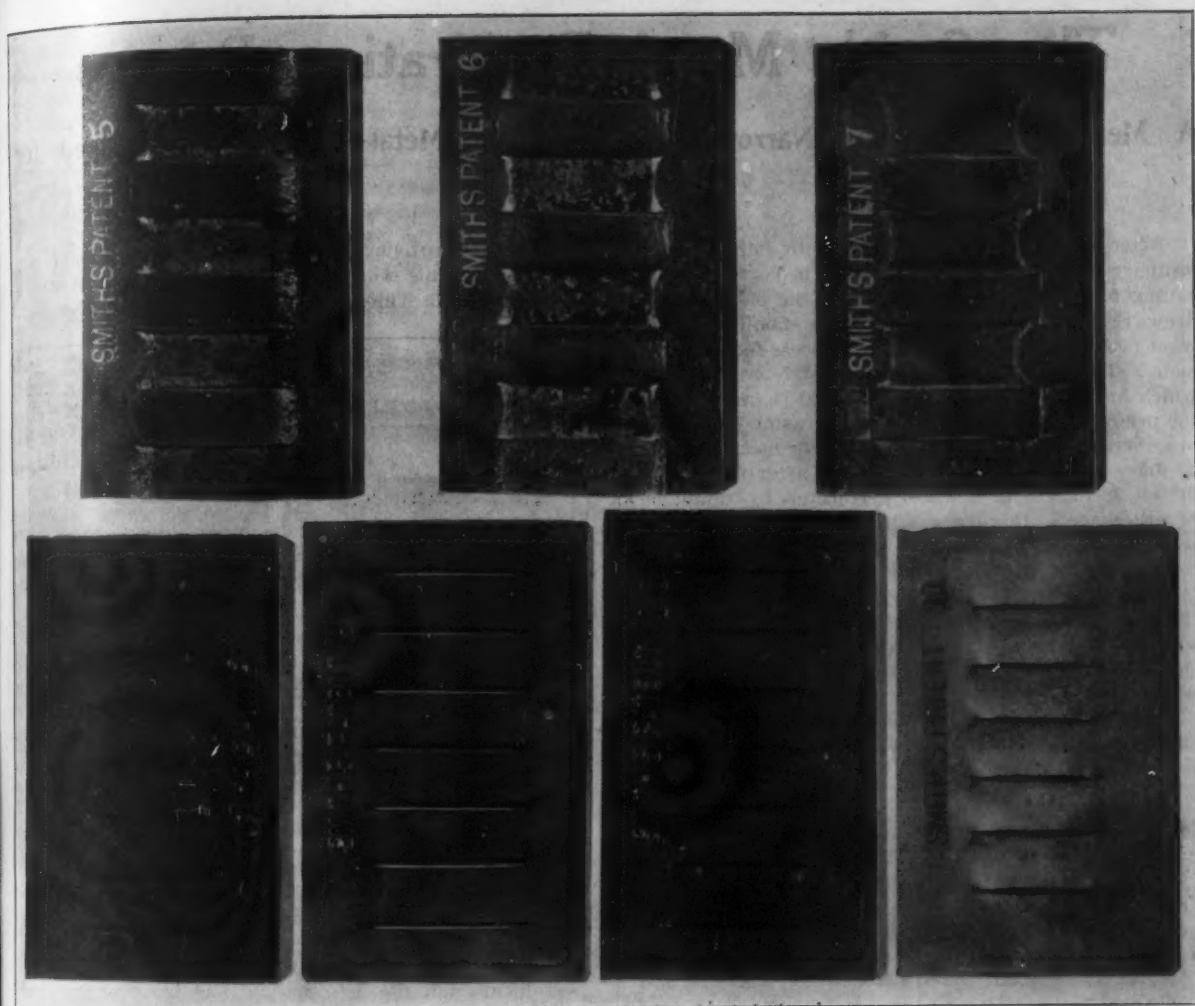


Fig. 4.—Samples Showing Stages in the Smith Process for Perforating Narrow Slots in Thick Metal and a Type of Perforation Used for Casing Lining.

be done by having suitable dies in rolls as well as it can be done in a gang punching machine. Sample No. 6, Fig. 4, shows a piece of 5-16-in. sheet steel depressed as in sample 5, and sample No. 7 shows the next step (which happens to be a piece of $\frac{1}{4}$ -in. steel), where the deformed parts have been rolled down and the plate made flat again. In this condition the metal is cracked through entirely on each line, and it but remains to stretch the uncut portions, thus opening the cracks up any required amount.

Sample No. 8, Fig. 4, is of a piece of $\frac{1}{4}$ -in. steel deformed, rolled flat again and the surface then ground to show the cracks as very fine slits before the metal has been stretched at all on the edges. Sample 9, Fig. 4, is a finished piece of metal of No. 12 gauge, which has been stretched to give a substantial opening in the perforations. A similar piece of $\frac{1}{4}$ -in. sheet steel is shown in sample No. 10. Sample 11 is a piece of sheet steel slotted after the manner indicated in sample No. 4, Fig. 3, but of lighter gauge, such as is used for reinforcing the larger well casings. Sample 12, Fig. 5, shows the smallest slot that can be perforated in thin sheet steel by the ordinary punching process. This is of course entirely too thin to be used for well casing.

Cross sections through metal with different widths of perforation of both straight and tapered form are shown at A, Fig. 6. By this system of sheet metal perforating it is possible to make finer slots than can be produced in thick metal with a punching machine by any other means. It does away with the use of fine saws, fine milling tools and fine punches, such as were required by the old processes, resulting in the saving of considerable money for tools. Screens with slots 1-1000 of an inch wide can be made in metal $\frac{1}{2}$ in. thick if desired.

The Well Casing

A section of the patented well casing, using two tubes perforated in the two different ways before described, is shown by B, Fig. 6. No rivets are used and all seams are

welded. It is claimed to be the only casing in which the perforations close when undue pressure is applied to them. The casings are electrogalvanized after the perforating operations, so that no part of the water ways is left unprotected. A 10-in. well of this type has perforations equal in area to those of a well 10 ft. in diameter made of the old cracked casing, and it is at the same time over 10 times as strong. It can be forced to a greater depth in the ground because it is smooth on the outside. There are no rivets to fall out and let in the sand, no bulging cracked perforations nor collars to offer resistance, and no thin, jagged, unprotected waterways to clog up with rust. The reinforcing inner pipe is corrugated so that its cut or perforated rings are out of contact with the outer casing and its solid portion in contact with it. These points of contact with the outer casing are in line with the perforations in it, so as to provide reinforcing strength where the outer pipe is weakest. The corrugated reinforcing inner tube is not necessary in small casings but is intended for dug wells, 4, 5 or 6 ft. in diameter, to be used instead of wooden cullings.

The Smith well casing is the only one which uses the walls of the casing as the strainer. C, Fig. 6, shows a casing without interior reinforcing. It can be made as



Fig. 5.—The Limit of Narrow Slot Perforating by Direct Punching and Possible Only in Thin Metal.

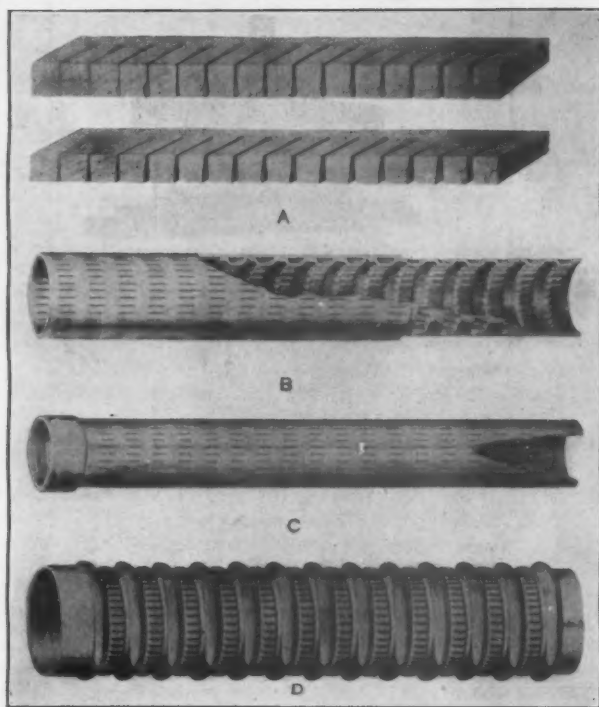
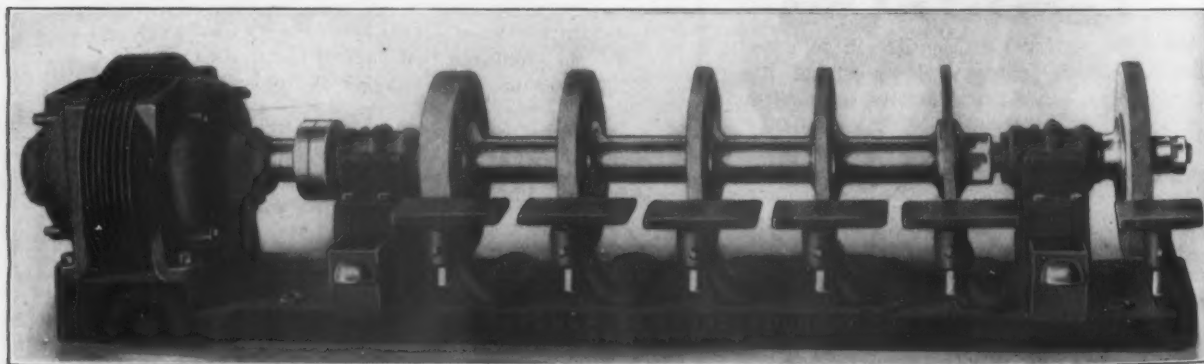


Fig. 6.—Sections of Perforated Thick Metal, Reinforced and Plain Well Casing and Perforated Metal Tile as Manufactured by the Smith Process.

thick as $\frac{1}{2}$ in. and with perforations 1-1000 in. wide if desired. The advantage of using V slotted perforations is that any sand which enters at all will pass entirely through the pipe and can be pumped out. The tapering form of the slots in the lower plate A, Fig. 6, may be produced by upsetting one side of the depressed part before the deformations are rolled down flat again. The nature of the punching may also be such as to produce the tapering of the perforations, the depressed parts



A Six-Wheel Motor Driven Grinder Built by the Gardner General Foundry Company, Gardner, Mass.

being driven into dies which shear or compress the metal to a slight angle.

When the oil sands are struck the gas and oil at once enter the perforations, thereby relieving the pressure and preventing the oil sands from heaving up in the casing. When the perforated casing has been put down the required depth the well casing itself acts as a strainer and will drain the last drop of oil from the sand. It is not necessary to pull the casings to perforate them, nor to insert perforating tools. No strainer has to be lowered into the well after the casing is driven, nor does earth have to be pumped out for weeks after it is installed. Even in the event that these wells become clogged the obstructions can be dislodged by lowering a pneumatic hammer into the well, causing it to deliver blows against the inside of the pipe.

Drain Tiles

Another use for this perforated metal is for drain tiles as shown by D, Fig. 6. These are designed to replace the old style clay tiling and can be made in any diameter and length. They have more perforations to

1 in. than clay tiles have to a foot and one of 24-in. diameter has more openings than a 24-in. diameter clay tile. The metal tile is especially suitable for drainage, sub-irrigation and filtration systems, and the aeration of land. It is cheaper to transport, not subject to breakage, does not have to be dug up to put the tiles in line and puts an end to stoppages in the draining system. It may be used for watering lawns and gardens by simply turning on a valve, doing away with hose and unsightly hydrants and leaving the grass substantially dry on the ground.

The Gardner Six-Wheel Grinder

A six-wheel grinding machine is being built by the Gardner General Foundry Company, Gardner, Mass., which has special serviceability in woodworking shops and other manufacturing establishments. On the one machine can be ground molder knives, cutters, drills and other tools, where different shapes and grades of wheels are needed, and if desired two or more can be ground simultaneously. Of most importance is the time saved, unless an equivalent equipment in separate machines was provided, and that would require a greater outlay and more space.

The machine is of the bench type, with a single spindle carrying all the wheels and driven either by a directly connected electric motor or a belt, the former being the one illustrated. The wheels used can be as large as 14 in. in diameter and range from $\frac{1}{8}$ to $2\frac{1}{2}$ in. in thickness. The tool rests swivel, and can be adjusted vertically. The bearings have the renewable sleeve type of ring oilers and are $1\frac{1}{4}$ in. in diameter. The diameter of the arbor is $1\frac{1}{2}$ in. in the bearings and 1 in. at the end. The coupling used is of the flexible detachable type, which in the motor driven machine enables the wheel arbor to be removed from the bearings without disturbing the motor.

As illustrated, the grinder is driven by a $\frac{3}{4}$ -hp. single-phase 110-volt alternating current General Electric motor running at 1800 rev. per min. If desired a two or three phase alternating current motor wound for any

standard voltage, or a direct current motor can be furnished. The overall length, including the motor, is $5\frac{1}{2}$ ft., and the height from the table to the center of the arbor 7 in. The shipping weight is 530 lb. with the motor and 375 lb. without it. In the belt driven machine, tight and loose pulleys 5 in. in diameter with 4-in. face are used, thus doing away with a countershaft.

S. F. Bowser & Co., Inc., Fort Wayne, Ind., instead of establishing a branch plant at Dallas, Texas, have located a branch office there, which will have complete jurisdiction over the Southwest territory. The increased demand for their product in that section has been such that this step was found desirable. J. G. Rodman will be district manager, in charge of the office. They further state that increased business has warranted them in establishing other new branch offices this year in St. Louis, Minneapolis and Atlanta. They now have 10 branch offices in the United States and Canada and one in the city of Mexico. They manufacture the Perfect self-measuring oil tank and oil storage systems.

The Kant-Leak Kleets and Press

A New Type of Roofing Cleat and the Machine Making It

A new type of roofing cleat, which is a radical departure from the commonly used washers or buttons made from light scrap tin or lead, and a press for making it have been developed by the Fred J. Swaine Mfg. Company, Seventh and O'Fallon streets, St. Louis, Mo. A special advantage of the cleat is that it keeps the edges of the roofing from buckling. The press is entirely automatic in operation and effects a maximum economy in the material used. Fig. 1 is a view of the cleat, while

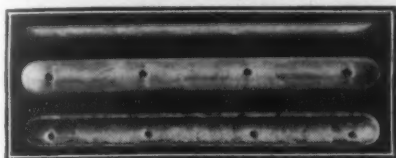


Fig. 1.—The Kant-Leak Kleat Made by the Fred J. Swaine Mfg. Company, St. Louis, Mo.

Figs. 2 and 3 show the press and the dies employed in its manufacture. The minimizing of the material wasted by this press is fully brought out in Figs. 4 and 5, the former showing a sheet in which the older dies were used and the latter illustrating a sheet stamped with the new die.

The cleats are 6 in. long, $\frac{5}{8}$ in. wide and $\frac{1}{4}$ in. deep, and are made complete from a No. 28 gauge galvanized sheet, with practically no waste. The operation of the

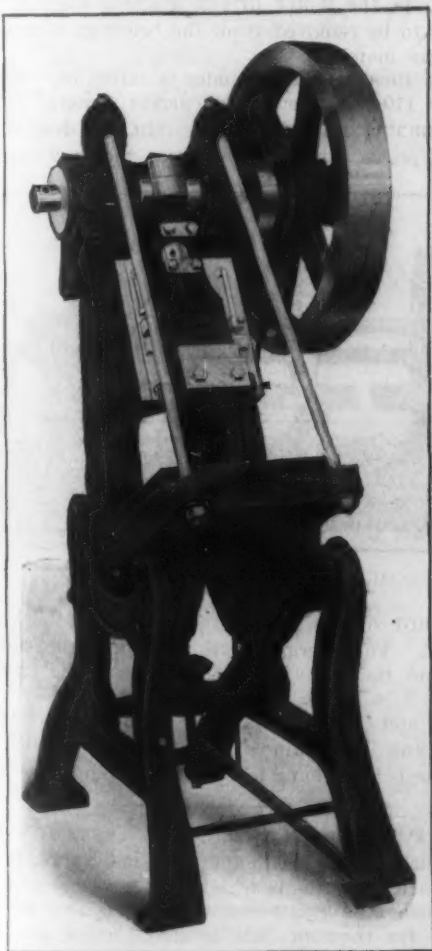


Fig. 2.—The Press in Which the Cleats Are Formed.

press is entirely automatic from the time the metal strip is placed on the gravity feed slide. The press is inclined, as shown in Fig. 2, so that the strips of metal are fed to the die by gravity. A complete cleat is made at each stroke of the press, and is discharged from the die by an automatic knock-out and drops by gravity through the

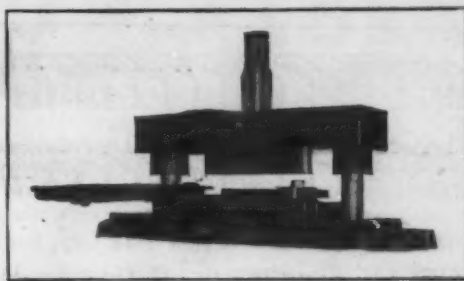


Fig. 3.—The Dies Used to Punch the Cleats.

open back into a chute, which carries it to the packing department on the floor below. In use these cleats are placed end to end, which prevents the edges of the sheets of roofing felt from buckling, while the edges of the cleats are imbedded in the roofing, thus preventing their rusting.

The press, Fig. 2, is one of the maker's improved inclinable open-back machines, and has an average capacity of 1,250,000 cleats per month. Among its new features are the use of vanadium steel in the clutch parts and shaft; providing lugs for tie rods, which may be easily inserted or removed; an increase in the die space from the slide to the bolster plate and the use of a larger bed. An additional locking point for the clutch has been provided which makes its operation instantaneous, and enables the press to be used even if one of the clutch bolts or connections should break or get out of order, as the broken or defective part can be very quickly removed and the press operated with the remaining bolt. Even



Fig. 4.—A Sheet from Which the First Cleats Were Stamped.

when the press is inclined, the front of the bed is not at an awkward height, since the swiveling point is toward the front and that edge of the bed remains at practically the same height whether the press is upright or inclined. The back of the press is raised and lowered by a screw and nut, the latter operated by inserting a round bar in holes in its faces. All of the bearings are self-oiling and scraped to a fit. Three parallel lines for gripping punch shanks are obtained with the box cap grip, and there is an improved bearing of ample proportions for the end of the pitman on the slide. The press is made in



Fig. 5.—A Sheet Showing the Small Amount of Waste with the New Dies.

11 different sizes, either plain or geared, and weighing from 350 to 9500 lb.

The simplicity of the dies, which are shown in Fig. 3, deserves mention. This is secured by eliminating the stripper and avoiding the complication of a roll or other mechanical automatic feed. At first the dies were made to leave a trimming of 1-16 in. on all sides of the cleats, as shown in Fig. 4, but they have been developed until now the strips are made only as wide as the length of the cleat, and no metal is left between cleats, the back gauge serving as a guide for the punch. The only scrap portion is the shaded part, shown in Fig. 5. This change in the method of stamping the cleats allows 14 per cent. more cleats to be made from the same quantity of metal, and saves in the amount of scrap for each press operated on this work 3500 lb., or more than \$100 worth per month.

The Thomas Meter

An Electrically Operated Device for Measuring Gases of All Kinds, Including Air

At the annual meeting of the American Society of Mechanical Engineers, held in New York City, December, 1909, Prof. Carl C. Thomas of the University of Wisconsin presented a paper dealing with a new type of meter, which he had invented. A brief abstract of this paper, together with the discussion on it, was printed in *The Iron Age*, December 16, 1909. This instrument, which is now being made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis., is the commercial outgrowth of a very thorough and extensive laboratory investiga-



Fig. 1.—Exterior View of the Thomas Meter Made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis.

tion of the specific heat of superheated steam, which Prof. Thomas has carried on for a number of years. The meter is designed for indicating, integrating or graphically recording the quantity of flow of gases, including blast furnace gas, natural gas, illuminating gas or air at any temperature or pressure, and is entirely independent of variations in either. The operation of the meter depends upon the principle of adding a known quantity of heat to the gas electrically, and determining the rate

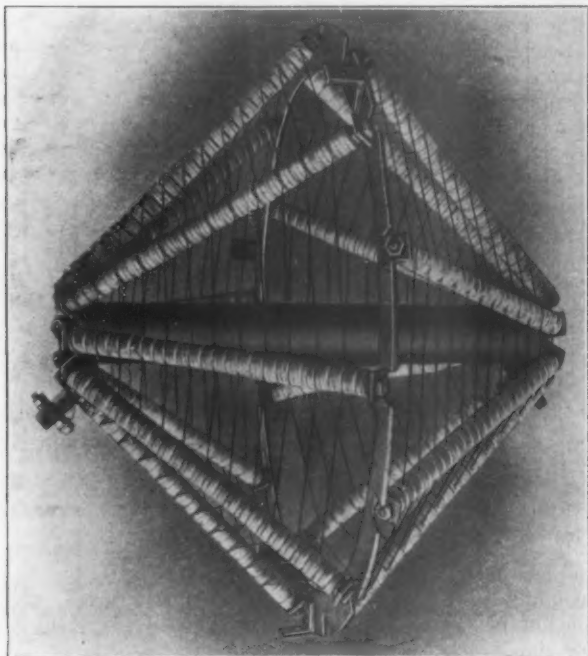


Fig. 2.—The Electric Heater.

of flow by the rise in temperature between the two ends of the apparatus. It is thus possible to measure gas or air at any temperature and at any pressure, and the accuracy of the meter is not affected by fluctuations of pressure or temperature, since in heating the gas or air, the weight and not the volume is dealt with. Its most

important features are that there are no moving parts inside the gas main, its operation is independent of temperature or pressure, and meters of large capacity occupy little space.

Fig. 1 is an exterior view of the meter casing, which constitutes that portion of the apparatus which is inserted in the pipe line carrying the gas or air that is to be measured. The two parts of the meter located in this casing, the electric heater, and one of the resistance thermometers, are illustrated in Figs. 2 and 3 respectively, while Fig. 4, which is a section of the casing, shows their relative positions. The switchboard and the recording mechanism of the meter, which, if desired, can be placed as far as a mile away from the other portion, is illustrated in Fig. 5, and a diagram of the connections is given in Fig. 6. A portion of the continuous autographic record, produced by the meter, showing the rate of flow and its variations in standard cubic feet of gas,

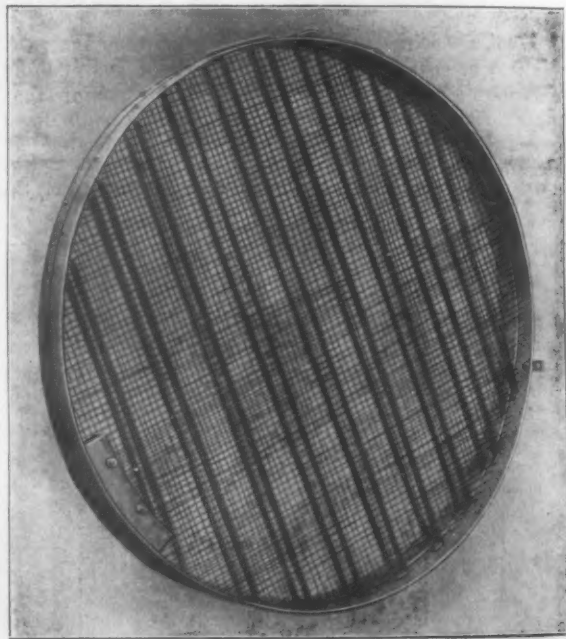


Fig. 3.—The Nickel Wire Resistance Thermometer.

referred to a standard of 60 degrees F. and 30 in. of mercury, is reproduced in Fig. 7.

The Construction of the Meter

A diagrammatic view of the meter is given in Fig. 4. The meter consists of an electric heater, *b*, which is formed of resistance material and placed across the gas passage *a* in such a way as to impart heat to all of the gas passing through the pipe line. A view of the heater proper is given in Fig. 2. In this way the temperature of the gas is raised from that at which it enters the meter to some higher exit one, and this rise is controlled by the two electrical resistance thermometers *c*, Fig. 4, in connection with the automatic regulating mechanism shown on the switchboard.

These thermometers, one of which is illustrated in Fig. 3, are in the form of screens of nickel wire, which change its electrical resistance in direct proportion to temperature changes. These screens are placed so as to come in contact with all the gas passing through the meter, and constitute two arms of a Wheatstone bridge. Any variation in the difference of temperature between them, which results in a corresponding variation of their resistance, causes a galvanometer needle to be deflected and increase or decrease the amount of electrical energy required to maintain a fixed temperature change in the gas. The record of the gas flow is read directly from

the dials of an integrating wattmeter or from the curves drawn by a recording instrument.

The Operating Principle

If gas or air is flowing at a uniform rate through the passage *a*, Fig. 4, and there is in this passage an electric heater, *b*, consisting of resistance material through which a current of electricity is passing and

by the addition of a known amount of heat to the gas. One of these records is reproduced in Fig. 7. While this method is excellent for research work where it is possible to secure a constant voltage, it cannot be applied to meters in commercial service where the voltage is seldom, if ever, constant. In commercial meters such as the one described, instead of measuring a varying temperature difference, the temperature difference is kept

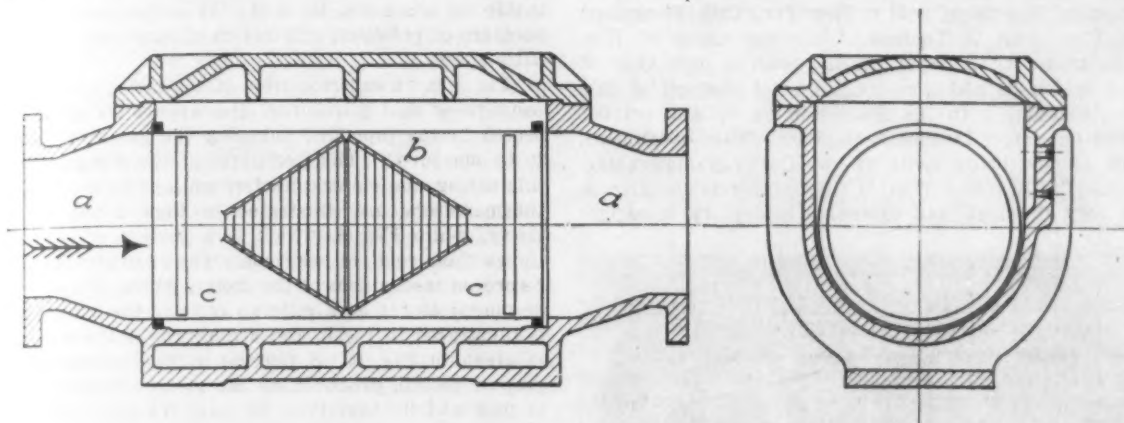


Fig. 4.—Diagrammatic View of the Meter Casing.

from which heat is being liberated at a constant rate, it is evident that if the rate of flow of the gas and the liberation of heat are both uniform and constant, that the gas will have its temperature raised a certain fixed number of degrees by its passage through the heater. If the rate of flow of gas is increased but the heat radiation remains the same, the temperature difference will

uniform, and the number of watts required to maintain this constant difference between the temperature at the inlet and that at the outlet varies directly as the quantity of gas or air flowing. In this way the input of energy in watts forms the measure of the quantity of air or gas flowing, and is measured by a wattmeter of either the graphically recording or the integrating type.

The fixed temperature difference, which is about 2 degrees F., is maintained by the action of a device made upon the same general principle as the autographic temperature recorders used in connection with resistance thermometers. This device is constructed on the principle of the Wheatstone bridge, and operates to change the energy input to the heater, according to the difference in the electrical resistance of the two thermometers. This difference depends upon the extent to which the temperature of the gas passing through the screen at the



Fig. 5.—The Switchboard and the Recording Mechanism of the Meter.

decrease, as the heat given off will be insufficient to raise the temperature of the larger quantity of gas. Briefly, this temperature difference varies inversely as the rate of flow of the gas so long as the rate of heat radiation is constant. During the development of the meter, this method of measurement was used. The rate of flow of the gas was measured by a graphical temperature recorder, showing the temperature rise produced

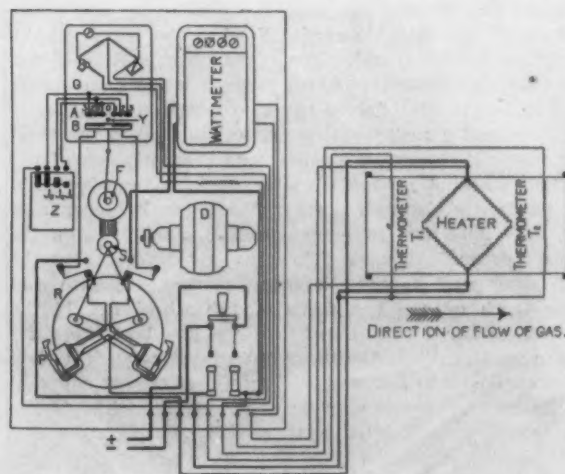


Fig. 6.—Connection Diagram of the Meter.

outlet end of the meter has been raised by the heater, and as soon as it becomes greater or less than that corresponding to the desired difference of 2 degrees, the amount of current flowing is varied so as to produce the standard temperature difference. In this way as the flow of gas increases, the temperature difference has a tendency to decrease, and additional energy is introduced at once to heat the increased weight of gas so as to maintain the constant temperature difference of 2 degrees.

The Operating Mechanism

Referring to the operating mechanism, which is shown mounted on the switchboard in Fig. 5 and diagrammatically in Fig. 6, the measuring of the gas or air is done

in the following way. In Fig. 6 the controller G is in reality a combined galvanometer and Wheatstone bridge. Changes in the difference in the resistance of the thermometers from that corresponding to the standard temperature difference of 2 degrees between the inlet and the outlet of the meter causes the movable member Y to swing to one side or the other of the neutral position O, movement to the left corresponding to an increase in

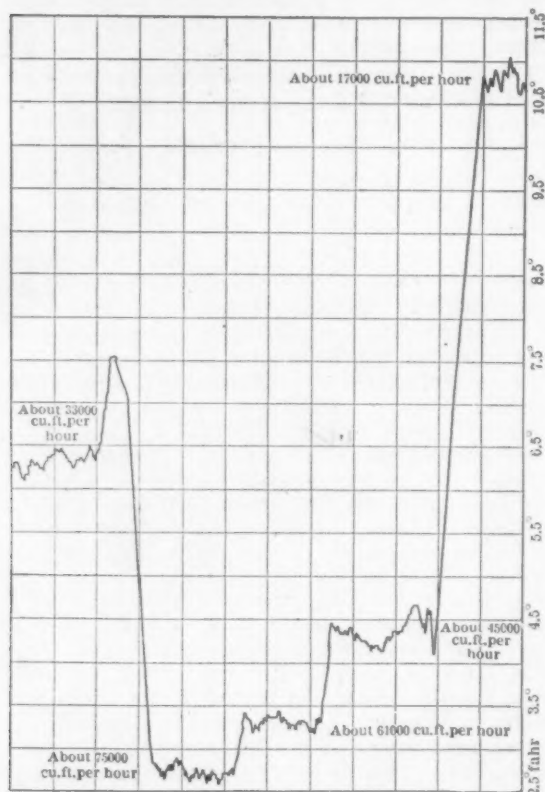


Fig. 7.—Typical Curve Made by the Meter.

the temperature difference, while that in the opposite one corresponds to a decrease. A $\frac{1}{8}$ -hp. motor, D, operates continuously and transmits motion to the bar B through the crank F, causing it to move up and down and clamp the movable needle Y when the bar is at the upper end of its travel. The contact drum Z is driven at a slow and a constant speed through gearing, as shown in Fig. 5. It also drives the two eccentrics S, Fig. 6, which impart a reciprocating vertical motion to the rheostat pawls P through a small arc on the periphery of the toothed wheel R on the rheostat shaft. The wheel and the pawls are clearly shown in the lower left corner of Fig. 5. There are three segments, J₁, J₂ and J₃, on the contact drum Z, Fig. 6. These are of different lengths and correspond to the distance between one, two and three teeth on the periphery of the wheel R. If the moving needle Y is clamped into position 1 at the right of the zero position, the pawl is engaged at such a time in its stroke as to increase the amount of energy supplied to the heater by one step on the rheostat, while if the connection is made to the corresponding contact on the left side, the energy is decreased in the same proportion. If the needle is clamped in position 2 the energy input is varied by two steps, according to the side of the neutral point on which the contact is made, and a variation of three steps is secured if the needle is clamped in the position 3. The needle is returned toward the neutral point after the change in resistance is made, and this change continues until that point is reached. If the needle is clamped in the zero position the rheostat is not moved. The wattmeter in the upper right corner of the switchboard shows the energy which has been supplied to maintain the constant temperature difference. If the instrument used is of the integrating type, the dials are arranged to register the total number of cubic feet of air or gas passing the meter, but if desired a recording instrument can be used to show graphically the variation in the flow.

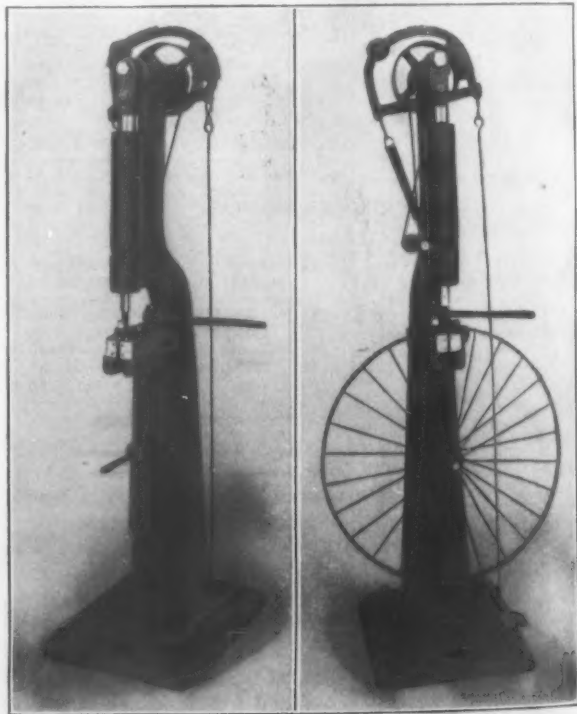
The meter can be used for measuring the discharge

of gas or air from compressors, blowers, &c., because the small and rapid periodic fluctuations of pressure due to either suction or discharge conditions do not interfere with the steady action of the thermometers. The time lag in the latter is sufficient to smooth out the curve, and true average results are thus indicated. As the meter is capable of measuring gas under varying pressures and temperatures accurately, it is especially valuable for measuring natural gas and also compressed air. The gas or the air being measured can also be either dry, saturated or superheated. If the water present is carried along mechanically, as a fog or a mist, its evaporation by the meter would interfere with the securing of accurate results, but this fog or mist can be transformed into dry vapor readily by introducing heat at the inlet of the meter. This is generally supplied by a small steam radiator, consisting of a coil of pipe and the steam can be introduced either at or above atmospheric pressure, as may be most convenient.

The electrical energy required to operate the meter is approximately about 1 kw. per 75,000 cu. ft. per hour at atmospheric pressure. The chart reproduced in Fig. 7 shows a variation in the rate of flow of from approximately 17,000 cu. ft. to 75,000 cu. ft. per hour, and the energy input was about 1.15 kw.

A Shuster Special Riveter

Wheels with wire or round rod spokes, such as are used for agricultural machinery, are manufactured in this country by the thousands every year. For the special task of riveting the spokes of these wheels to the rim, and at the same preserving a uniform radius, the F. B. Shuster Company, New Haven, Conn., has specially



A Special Wheel Spoke Riveter Built by the F. B. Shuster Company, New Haven, Conn.

equipped its elastic blow riveting machine. Fig. 1 is a view of the machine itself, and Fig. 2 shows it in operation.

The mandrel upon which the hub of the wheel is mounted has an adjustment on the base of the column to care for varying diameters. On the table are jaws operated by a cam, the movement of which opens and closes the jaws under the control of a lever handle. A piece of steel grooved to grip the wire spoke is set in each jaw. These two pieces constitute the anvil, the upper surface of which has the proper curvature. The distance between the top of the anvil and the center of the mandrel is fixed and consequently the radius of the

wheel remains constant as the rim is turned from one spoke position to another. The diameter of the spokes which can be riveted ranges from 3-16 to 1/2 in., and if there is any inequality in their length, the only effect of this is to change the size of the riveted head on the rim. The mandrel has sufficient length to enable the wheel to be slid to a plane in front of the jaws before turning to the next position.

The American Radiator Company's Annual Report

Increase in Net Profits of \$225,917.91

The American Radiator Company's twelfth annual report, covering the operations of the fiscal year ending January 31, 1911, shows the profits to have been as follows, compared with the previous year:

	1909-10.	1910-11.
Net profits.....	\$971,599.52	*\$1,772,517.43
Less dividends—Preferred stock	210,000.00	210,000.00
Common stock.....	400,000.00	569,000.00
Totals.....	\$610,000.00	\$779,000.00
Balance.....	\$361,599.52	\$993,517.43

* Includes \$575,000 surplus from sale of common stock to stockholders. Trading profits for the year \$1,197,517.43.

The balance sheet at the close of the fiscal year compares as follows:

	Assets.	1909-10.	1910-11.
Real estate, plants, machinery, patents, &c., February 1.....		\$8,611,259.14	\$8,693,179.94
Additions during year.....		281,920.80	1,344,581.86
Totals.....		\$8,893,179.94	\$10,037,761.80
Less depreciation.....		200,000.00	200,000.00
Net.....		\$8,693,179.94	\$9,837,761.80
Cash.....		\$774,408.30	\$1,115,058.47
Notes receivable.....		10,834.03	111,395.81
Accounts receivable.....		1,167,051.21	1,911,725.68
Raw materials, supplies and finished products.....		2,192,556.46	2,030,270.43
Total quick assets.....		\$4,144,850.00	\$5,168,450.39
Totals.....		\$12,838,029.94	\$15,006,212.19
	Liabilities.		
Capital stock, preferred.....		\$3,000,000.00	\$3,000,000.00
Capital stock, common.....		5,000,000.00	6,150,000.00
		\$8,000,000.00	\$9,150,000.00
Accounts and bills payable.....		311,379.98	336,044.80
Totals.....		\$8,311,379.98	\$9,486,044.80
Balance.....		4,526,649.96	5,520,167.39
Totals.....		\$12,838,029.94	\$15,006,212.19

The following extracts are taken from President Clarence M. Woolley's accompanying statement:

"A substantial increase in the volume of sales was accomplished. The results in this respect eclipse the records of all former years. The net profits are likewise greater than for any preceding year.

Cheaper Raw Materials Beneficial

"While the general business conditions which prevailed throughout the country during the year were not exceptionally favorable, the construction of new buildings was maintained on a broad scale. This offered an opportunity for a very large volume of business. The cost of raw materials required for the production of radiators and boilers was lower than for many years. This enabled us to establish lower selling prices for the finished product, thereby encouraging the purchasing public more extensively to employ our sanitary methods of heating and ventilation, while the further elaboration of selling methods and the economies realized by enhancing the efficiency of the individuals connected therewith resulted in a generous increase in the volume of business and the net profits.

"The producing capacity of the company was increased during the year by additions to existing plants and their equipment. A large plant was built at Kansas City, which is now in active operation, and has proved

of distinct advantage, in offering prompt and adequate service throughout the territory it covers. Further improvements have been made in methods of manufacture and in standardizing every important process connected therewith. A distinct advance has been made along the line of specialization and co-operation. The progress in this regard is particularly encouraging.

"During the past year the plan authorized at the last annual meeting, to allot shares of stock on easy terms of payment to employees, has been carried into effect and has further strengthened the enthusiastic co-operation of all, while increasing their efficiency by creating a sense of proprietary interest in the company.

The European Subsidiaries

"The German company has enjoyed another year of prosperity. The new plant which it constructed last year at Neuss, on the Rhine, is now in successful operation. This offers the necessary increase of producing capacity, so that, in conjunction with the plant at Schoenebeck, on the Elbe, an adequate supply can be produced to satisfy the requirements of the growing business in Germany, in The Netherlands, Scandinavia and over-sea countries. The French company has made further additions to its plant at Dole, and has increased its business and profits during the past year. The English company has also enjoyed another year of prosperity. It has further increased its producing capacity, its volume of business and profits. Its plant at Hull is provided with adequate capacity for the trade it serves in Great Britain and in foreign countries. The Italian company, which was organized last year, has completed its new plant at Brescia, 30 miles east of Milan, and is about to begin operations. A large demand has already been created in Italy, which heretofore had been supplied by the other European factories.

"The profits realized by the European companies have been employed in extending their business and in establishing the new plants herein mentioned, all of which have been paid for by the reservation of their earnings. Inasmuch as these European companies have declared no dividends, having utilized their earnings for further development of the business abroad, such income is not included in the annual statements of this company."

The New Cresco Monkey Wrench

A new monkey wrench, brought out by the Crescent Forgings Company, Oakmont, Pa., known as the Cresco, has only three parts, all drop forged, no malleable iron castings being used.

The wrench is very durable and easily operated. The three parts are case hardened all over. The nut is placed very near the handle, where it is easily adjusted



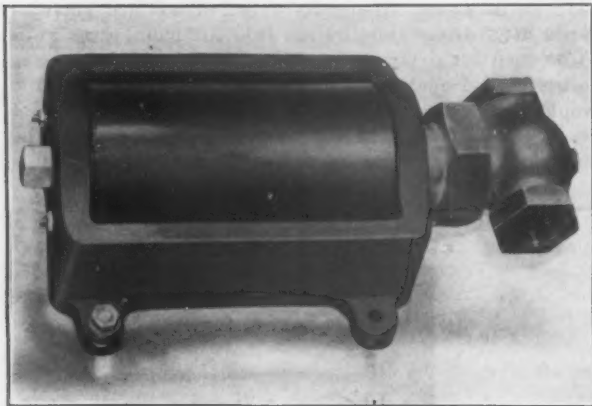
The Cresco Drop Forged Monkey Wrench Made by the Crescent Forgings Company, Oakmont, Pa.

by the operator, eliminating one of the objections to other steel wrenches now on the market. The T-shaped movable jaw is put into the slot in which it slides in the shank, while the latter is hot, the slot having been previously opened up. When the jaw is in place the slot is closed down upon it and all tendency for the jaw to become loose is done away with.

A New Edith Furnace.—The Carnegie Steel Company will rebuild its Edith furnace in the Pittsburgh district. About four months will be required for the work.

The Cutler-Hammer Solenoid Operated Valve

Electric solenoids have been applied to various devices, but it is only recently that they have been developed to control valves. As the result of several years' experimenting, the Cutler-Hammer Mfg. Company, Wilwaukee, Wis., is introducing a device in which a solenoid is employed to give remote or automatic con-



A Solenoid Operated Valve Made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis.

trol of a valve. Some of its special uses are in connection with double-acting compressors, as a part of hydraulic or pneumatic systems, with self-starters and for the remote control of valves used for setting brakes in pneumatic brake control systems.

The plunger of the solenoid is inclosed, so that it is virtually within the piping system and stuffing box friction is entirely avoided. Only a very small amount of

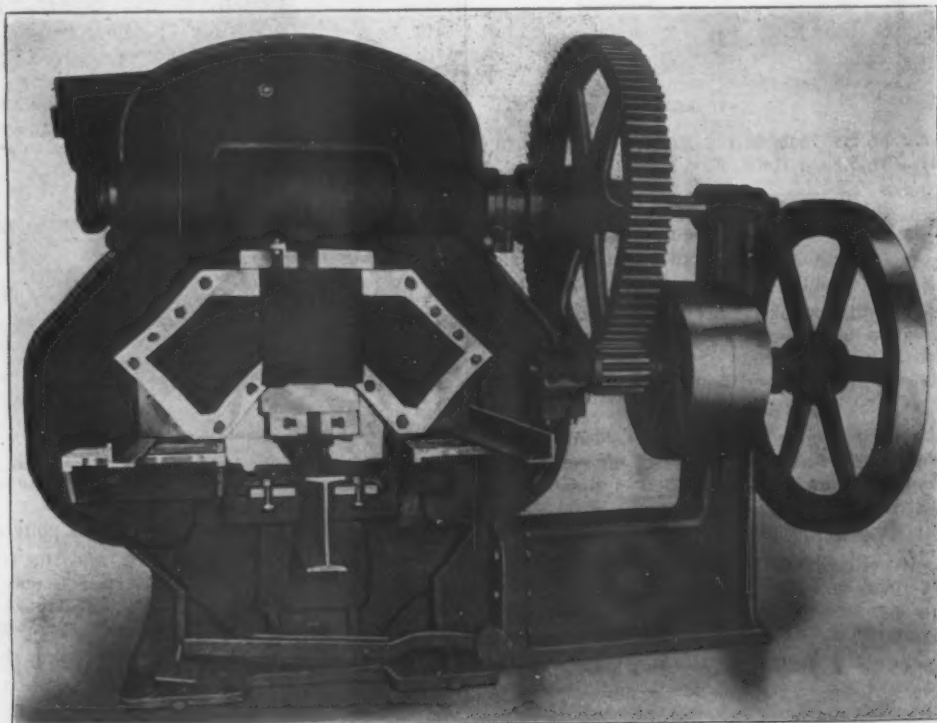
type and can be wound for voltages of 115, 230 and 500.

Considerable difficulty is frequently experienced in starting double-acting compressors under compression. This trouble can be obviated by employing a solenoid-operated valve to control a by-pass automatically, so that pressure can be released from the compression cylinder in starting. After the desired speed has been obtained, the load is thrown on the compressor by automatically closing the by-pass. Another application of the device is with a thermostat in a heating system to control the flow of steam automatically. Where air operated whistles are used for signaling purposes, it is possible to control all of them from a central location by installing these valves, thus saving long runs of piping. These devices can also be employed to control the amount of air in the compression tanks used for inflating tires in garages and the operating switches can be placed in the most convenient location.

The Leighton Combination Punch and Shear

A new type of combination punch and shear has been recently built at the Cincinnati Punch & Shear Company, Cincinnati, Ohio, by the inventor, George F. Leighton. The special advantage of this machine is that its complete weight is 8000 lb., which is the approximate weight of a shear of the same capacity.

The shears are located on each side of the machine, and if the material to be cut is light, two pieces may be operated on at the same time. The motion for the shears is derived from the center plunger, which is one of three driven by a single eccentric shaft. The machine is fitted with the inventor's automatic clutch, and at the point where the clutch is attached to the shaft, the latter is square. The punches and dies are adjustable, and it is possible to shear a piece at any desired angle. Three



A New Type of Punching and Shearing Machine Designed by George F. Leighton, Cincinnati, Ohio.

current is required to energize the coil, which lifts the solenoid plunger through a short free travel and unseats the valve by a hammer blow. When the valve is started, the pressure becomes almost balanced. The circuit in which the coil is included can be run so that the valve can be operated from one or a series of different places, as desired. Four standard sizes of valves are built, having diameters of $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 in. These valves are threaded for standard iron pipe and the area of the opening is approximately equal to that of the same size of pipe. The coils used are of the maker's standard

sizes of machine are built, having capacities of 12, 18 and 24 in., respectively, the first being the size illustrated. This machine will cope and punch a 12-in. I-beam and shear a 4 x 4 x $\frac{1}{2}$ in. angle iron.

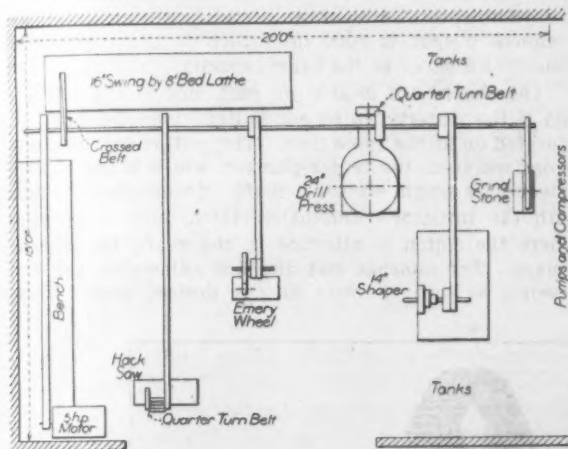
The Worth Brothers Company, Coatesville, Pa., states that its second blast furnace, now under construction, is not expected to be blown in before summer. This statement is made because reports have been in circulation that the furnace was completed and blown in last week.

The Machine Shop in the Ritz-Carlton Hotel

Not many years ago the engines, dynamos, boilers and a few pumps practically made up the mechanical and electrical plant equipment of a hotel. Now a modern hotel has a complete refrigerating system for making artificial ice, laundry machinery, air compressors, vacuum cleaning system, air washing machines and often many other special labor-saving devices. With such a varied equipment repairs and alterations requiring considerable machine work are often necessary, and instead of having this done by outside shops it has been found more satisfactory in many cases to do it on the premises.

The machine shop of the new Ritz-Carlton Hotel, New York City, is a good example of one required to keep the plant of a first-class hotel in repair. It was at first planned to devote a space about 20 x 35 ft. to the shop, but, owing to changes in the location of several compressors, the size was cut down, and the arrangement was materially modified.

The accompanying diagram shows the layout of the shop, which is on the same level as the engine room floor. A 5-hp. electric motor, fastened on the wall, drives a



Plan of the Layout of the Tools in the Machine Shop of the New Ritz-Carlton Hotel, New York.

main shaft, from which are driven a 16-in. swing by an 8-ft. bed Prentice lathe, a 24-in. Sibley heavy pattern drill press and a grindstone, and from countershafts a hack saw, an emery wheel and a 14-in. Gould & Eberhardt double-triple, quick-stroke, heavy duty shaper. On one side of the shop is a bench with vises. The tools are located so that the piston rods of the nearby engines and pumps can be removed without interfering with them.

On the mezzanine engine room floor is the electrician's workshop. Here an electric motor drives from a countershaft an 11-in. swing by 5-ft. bed engine lathe, a sensitive bench drill and an emery wheel. There are also benches for assembling work. On the same level are storerooms for bolts, wrenches, tools, &c.

In the boiler room is a blacksmith's forge, having a hearth 23 x 35 in.; a motor-driven Williams pipe threading and cutting machine, with a capacity of 1½ to 6 in. pipe; a 100-lb. anvil, hammers, tools and accessories.

With the above tools, machine, forge and pipe fitting jobs which are constantly arising can be readily done by the machinists employed by the hotel. It is expected that the shop will prove a great convenience, and that the cost of repairs to the operating plant will be kept at a minimum.

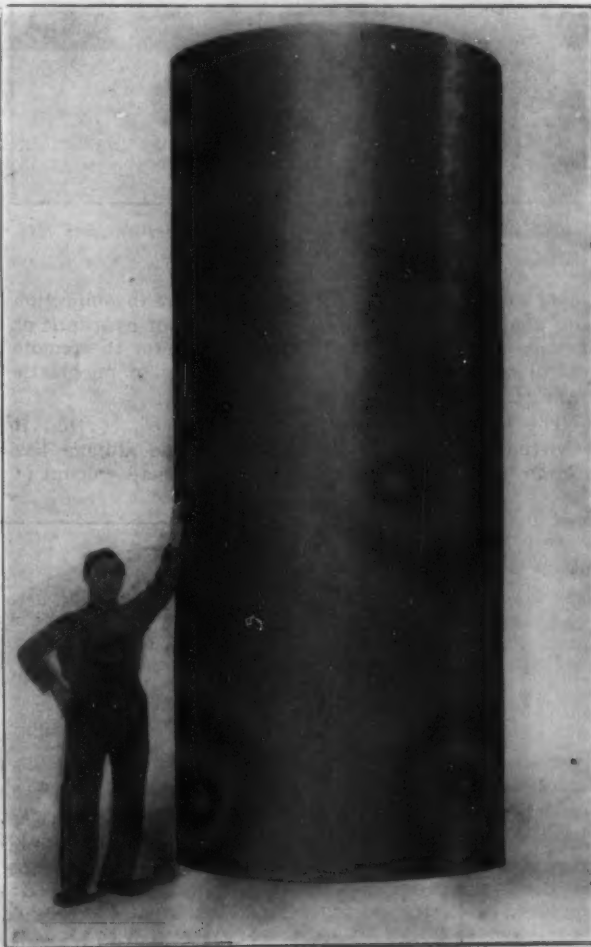
The J. B. & J. M. Cornell Iron Company's property and assets are to be sold. Judge Holt in the United States Circuit Court, New York, has signed an order directing A. Gordon Murray, trustee in bankruptcy, to sell all the company's effects March 20 at his office, 60 Wall street, to the highest bidder. Mr. Murray has been authorized to continue the business of the bankrupt company until March 27, when delivery is to be made to the purchaser as a going concern.

A Huge Bronze Drum Casting

The Buffalo Foundry & Machine Company, Buffalo, N. Y., recently made a very large bronze drum casting. It is interesting not only for its size and the material from which it was made, but the manner in which the metal was melted.

The casting is to be used as the drying surface in a large vacuum rotary drum dryer and is 12 ft. long and 5 ft. in diameter. Generally these drums are made of dense air furnace iron, but as this particular drum was to be used for drying vegetable extract it was necessary to use a good quality of bronze, as contact with the iron would discolor the extract.

Dry sand was used for the mold and loam for the core, both being swept up. The mold was placed in a



A Large Bronze Drum Casting, Weighing 16,000 Lb., Made by the Buffalo Foundry & Machine Company, Buffalo, N. Y.

vertical position when the casting was poured, which accounts for the very clean surface and the freedom from blowholes which was secured. About 16,000 lb. of metal was required to pour the casting, and this large quantity made it expedient to melt the metal in a 48-in. cupola. While this is rather unusual, the maker has followed this practice successfully where large quantities of metal are required.

The Sterling Machine Company, Norwich, Conn., states that its business has so increased as to compel the doubling of its capital stock for the second time. At a meeting of the stockholders held February 27 it was voted to increase the capital stock from \$50,000 to \$100,000 and to change the name from the Uncas Specialty Company to the Sterling Machine Company. Hereafter the business will be conducted under the new name, continuing the manufacture of Uncas specialties, comprising timers, distributors, automobile horns, hardened and ground parts for the motor trade and an automatic line of lubricators for automobiles and steam engines.

Gas Producer-Gas Engine Plants

Details of Installation and Maintenance Cost

BY WILLIAM O. WEBBER, BOSTON, MASS.

Considerable misunderstanding exists at present concerning gas producer-gas engine power plants. Two or three erroneous opinions are prevalent, one of which is that initial cost of such plants is greatly in excess of

The cost of operation, expressed in dollars per horsepower year, assuming fuel and labor to be the same for both types of plants; that is, coal at \$5 a ton, whether used in the steam boiler or in the gas producer, and

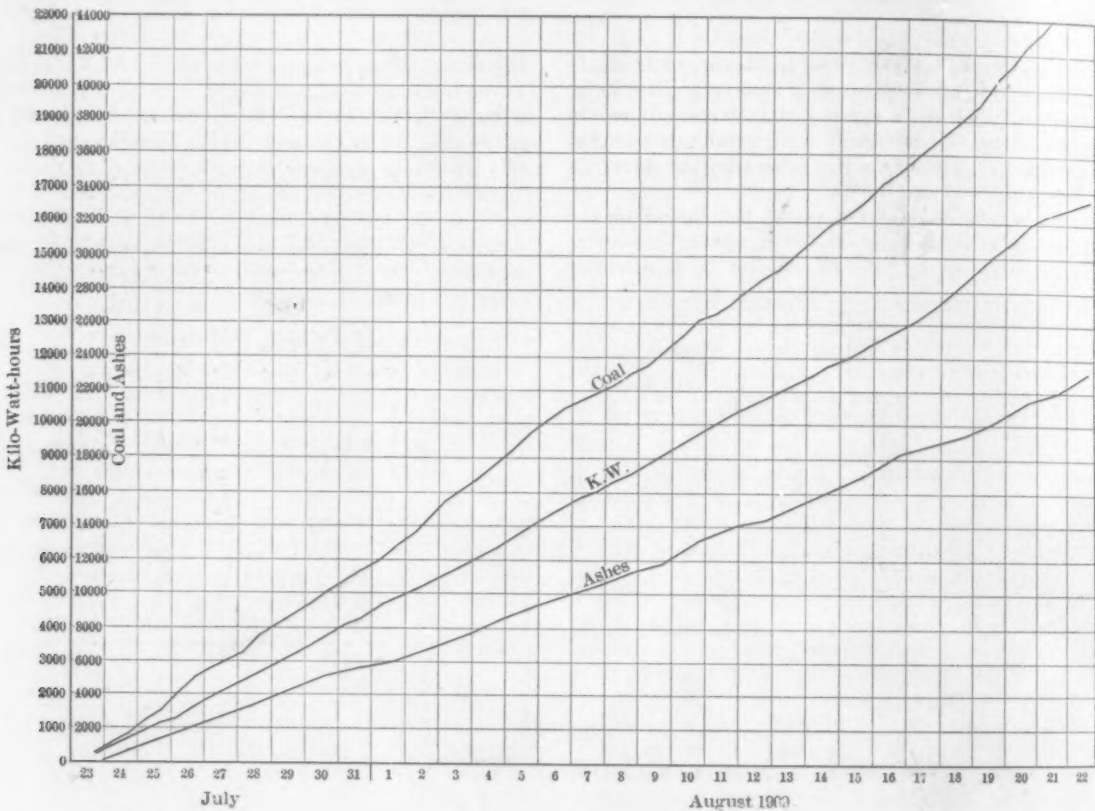


Fig. 1.—Log of a 30-Day Acceptance Test Showing the Relation Between Fuel, Ashes and Output.

steam engine or steam turbine plants. This is not always so, as is shown by the accompanying table giving the costs of complete plants of various sizes and both types. In preparing this table the cost of the land, the buildings and the generator have been excluded since they would be the same in either case, but all the auxiliaries together with the cost of foundations, setting, piping, cartage, freight and all other items which go to make up the initial cost of a complete working plant have been included.

Horsepower of plant.	Cost of steam plant.	Cost of gas producer-vertical gas engine plant.	
		Belted.	Direct connected.
34.....	\$100	\$132	\$150
60.....	90	99	112
100.....	85	76	88
140.....	80	69	76
190.....	75	68	73
280.....	70	68	76
380.....	65	68	73
420.....	63	69	75
500.....	62	..	*84
620.....	60	..	*86
1,000.....	65	..	*90

* Horizontal.

With reference to the comparative weights per horsepower of gas and steam engines, the following figures may prove of interest:

Horsepower.	Pounds per	Direct connected
	horsepower vertical gas engines.	Corliss steam engines.
60.....	240	148
140.....	275	143
190.....	280	140
300.....	290	140
*500.....	300	250
750.....	300	213
1,000.....	340	213
1,200.....	350	215
1,500.....	375	219
2,000.....	400	210
2,500.....	400	250
3,985.....	400	270

* Horizontal.

labor varying is given below. Fixed charges are also included in this table.

Cost Per Horsepower Per Annum.			
Horsepower.	Labor.	Steam engines.	Gas producer-gas engines.
20.....	\$30	\$146	\$75
40.....	20	120	42
60.....	15	105	38.65
80.....	12	95	35
100.....	12	86.40	30
200.....	10	77.10	27
300.....	8.60	69.22	25
400.....	7.25	61.90	24.5
500.....	6.20	55.29	24
800.....	5.40	49.28	23.5
700.....	4.70	43.79	23
800.....	4.15	39.73	22.5
900.....	3.75	34.05	22
1,000.....	3.50	29.80	21.5
1,500.....	3.25	25.77	18.75
2,000.....	3.00	21.75	17.25

In gas producer-gas engine plants the coal consumption varies from 1 lb. in the largest sizes, to 2½ lb. per horsepower per hour in the smaller sizes, while in steam plants this figure will vary from 12 lb. in a small 20-hp. plant to 7 lb. in a 100-hp. plant 5 lb. in a 500-hp. plant, 2½ lb. in a 1000-hp. plant, and 2 lb. in a 2000-hp. plant, where strict account is kept of all the coal used throughout the 24 hr., including the banking of fires during the night and the standover losses in both cases. These figures, from repeated experience under actual conditions, the writer knows to be correct.

Water Consumption

The water consumption of gas engines is larger than it is generally supposed to be, being practically the same amount per horsepower for either the gas or steam plant, that is, on the smaller sizes, 5 gal. per engine horsepower per hour for the jacket water to probably about 4 gal. on the larger sizes, besides which a similar amount

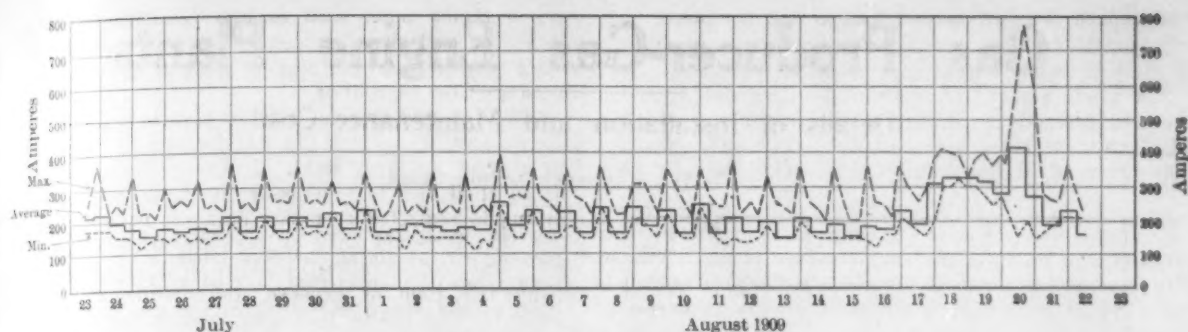


Fig. 2.—Generator Load Curve.

must be used in the producer per horsepower for washing purposes. The steam plant uses about 5 gal. of water per horsepower per hour for the simple plant down to 3 gal. per horsepower per hour on a condensing engine of 200 or 300 hp. or over for the generation of steam.

In condensing plants, approximately 26 times the water used by the engine is required by the condenser. All the waste heat escaping from the steam boilers is lost, except such as is utilized through a feed water heater or an economizer, or in building heating during the cold months. At present, through a gas engine, quantities of gases as great as 800 cu. ft. per horsepower per hour are wasted at temperatures of from 1800 to 1000 degrees. This is a field in which much work can be done, as these waste gases from the gas engine should all be absorbed preferably in heating hot air, which may be then utilized by being blown around the buildings for heating purposes, or in heating water which is then circulated, as has been successfully tried in a few plants.

Another very interesting question is that of getting rid of the cylinder jacket cooling water, so that the same water can be used over and over again. This is readily possible by using cooling towers preferably of the open type, placed upon exposed parts of the roofs of buildings and the water from the jackets forced there by electrically-driven centrifugal pumps. A cooling of 10 degrees, as a minimum, to 30 degrees, as a maximum, accomplishes all that is required and can be very inexpensively done by constructing a wooden cooling tower, where sprays of water are caused to fall over a set of louvers into an exposed tank, from which they flow by gravity to the jacket spaces.

Load Table

The engineer, in each case, should make up a table showing the horsepower hours of the different elements which go toward making up the whole load. This load should then be tabulated and the number of tons of fuel which would be required per annum ascertained. The writer recently made such a compilation, including the hours required on the ammonia compressor for a refrigerating plant, a laundry, the elevators, the ventilating and lighting, all of which required an estimated amount of 311 tons of coal. The actual consumption, last year, for this installation was 334 tons.

The writer also made another estimate showing the actual performance per brake horsepower for the producer gas plant, including coal, water, interest and depreciation, the lamp renewals and the attendance, or labor, which amounted to 1.227 cents per brake horsepower per hour. The actual returns from the year's run was 1.2 cents. The estimate of the total cost of wages, repairs and all expenses was \$6007, and the actual costs for the year were \$6026.62.

Further, there is no question as to the relative econ-

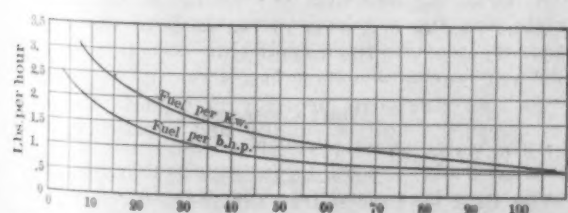


Fig. 3.—Curves Showing Fuel Consumed per Kilowatt and Brake Horsepower.

omy of gas producer-gas engine plants, which practically can be made to reduce the cost of power from one-third to one-half, but in the present state of the art it requires that all plans and specifications should be carefully drawn by a competent, disinterested engineer, with the details carefully planned out and adhered to strictly, and with the specifications clearly stating what the performance shall be, and maintained in actual working conditions over a sufficient length of time so as to preclude jockeying of the plant.

Plotting Test Results

Nothing less than a 30-day run should ever be accepted as a practical performance of any plant, and such performance should always include a period at the average load as it occurs, a period of at least a week at the capacity of the plant, and a period of at least 24 hours at the maximum which the plant might be forced up to in case of emergency or breakdown. In the results of these tests the number of running hours, the average load in percentage of engine rating, the pounds of coal gasified per hour, the ashes removed in pounds, the ratio

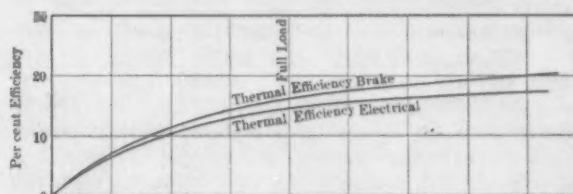


Fig. 4.—Efficiency Curves of the Generator.

of ashes to coal, the pounds of coal per brake horsepower hour, as well as similar values per kilowatt, should all be definitely stated. A statement of the average heat value of the coal, the British thermal units per brake horsepower per hour, from the engine, the thermal efficiency from the brake horsepower and the thermal efficiency as obtained from the electrical instruments on the switchboard should also be included.

A chart should always be prepared showing the consumption of coal, ashes, the kilowatt hours and the average daily and nightly load, in amperes, at six-hour intervals, at least, and the data should be kept at hourly intervals. This should also be supplemented by a recording watt meter, from which the kilowatt hours can be transcribed at regular intervals. These two parts of the chart are shown separately in Figs. 1 and 2. A curve, Fig. 3, should be plotted showing the fuel consumption per kilowatt and per brake horsepower per hour, from nothing up to full load, and similar curves, Fig. 4, plotted for the thermal efficiency covering the same ranges.

There are very many items regarding the location and the arrangement of producers, the position of the main pipes and the size of pipes in the connection between producer and engines, the type of shut-off valves, the location of the exhaust pipes and the exhaust pit outside of the building, sewer connections, or, if there is no sewer, a system of handling the exhaust water and the wash water, which should be insisted upon. The types of igniter batteries and igniter plugs, means of accumulating air in the air starting tanks should the electrical part of the plant give out for any temporary reason, means for starting the blowers independently, the location and the

description of the switchboard and in fact a number of items, should be very carefully specified so as to make the plant as nearly fool proof as possible.

The whole amount of work to be done per annum should be carefully estimated in the first place, and a daily load sheet, such as that produced in Fig. 5, drawn, so as to see what the requirements should actually be

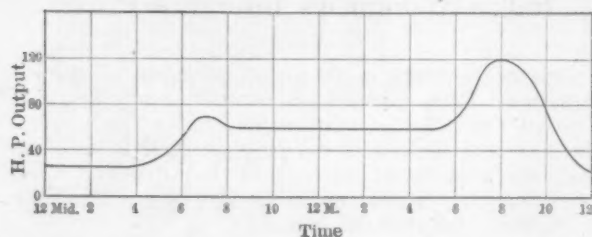


Fig. 5.—A Typical Daily Load Curve of the Plant at the Soldiers' Home, Chelsea, Mass.

during any given hour of the day. This will determine how the power units should be divided and must be very carefully done, as it is not possible to carry an overload upon a gas producer-gas engine plant which can be carried up on a steam engine for a moderate length of time. There should always be an engine unit and a producer unit, which can stand idle most of the time, so that they can be properly cleaned, kept in repair and generally taken care of. This is practically imperative in a plant which is to be operated 24 hr. a day, but is not required in a plant which is only in operation during the day time.

Fenestra Solid Steel Window Sash

Fenestra solid steel window sash, for factories, power house, garages, &c., manufactured by the Detroit Steel Products Company, Detroit, Mich., is a new product of steel that has won unusual recognition in the last few years. In scores of large new plants that have been erected recently this material has been specified. In several important large plants steel columns and curtain walls of Fenestra design have replaced the customary brick wall, with very satisfactory results. It makes a wall of glass with a steel frame that offers the least obstruction to the light, so that the interior of a building is flooded with soft light instead of depending upon small windows in a brick or concrete wall. When the conventional window is retained the Fenestra sash makes it possible to have larger openings, with a convenient plan of ventilation.

The Fenestra sash is made of steel bars, rolled in a special section. It is manufactured in units, each unit containing as many panes of glass as may be specified. The peculiar and original feature of this steel sash, covered by patents, is in the joint where the bars cross. The T bar which is to form the vertical member in a sash has a slot punched in the web. The head and the remaining outer edge of the web are then spread so that the horizontal bar can be inserted, after which the portion of the web which has been bent out is pressed into a notch in the horizontal bar. This makes a very strong joint and renders it possible to construct walls with openings of large area with light steel bars. While it is not expected to meet the aesthetic requirements of an office or public building, it is particularly suitable for factories, warehouses and other structures in which perfect light and economy in cost and maintenance are the prime considerations.

Double flange bars are used for the outside members of the sash, of a special section, which is adapted to either brickwork or concrete. Only two sections of bars are used in the manufacture of the standard sash—the T bar for the inner mullions and the double flange for the outer members. The sash is shipped in units, unglazed, and the standard construction is adapted to take standard sizes of glass, from 10 x 16 to 12 x 18 in. panes. One of the important features in the construction of windows or walls of this type is the opportunity for ventilation. Each unit of the sash is readily arranged to

carry a tilting inner sash or two ventilating sections which open and close together by the same mechanism. In this way 20 to 30 per cent. or more of the total area can be used for ventilation.

While the cost of steel window sash is necessarily a little greater than wood, the maintenance and depreciation charges are very light. If the mullions are kept painted their life is practically indefinite, and even if painting is neglected corrosion does not have the same effect that it would have on sash constructed of sheet steel. The maintenance of windows in a large plant is a considerable item of expense, and architects and engineers for this reason look with great favor on the introduction of solid steel in window construction.

Light has been found an important factor in efficiency, especially where a large number of operatives are engaged in work which requires constant attention of the eye. A large window area affords the largest possible volume of soft light, which does not throw shadows on the work and at the same time creates more cheerful conditions for the operatives. An appreciable gain in efficiency is said to have been noted in large plants where the Fenestra system of lighting has been adopted. The perfect ventilation secured by this construction has also been found to have a marked influence on the health of the operatives.

The question of fire hazard is always an important one in factory construction, and on this point the Fenestra sash has recently stood a severe test. In a New England factory a shed containing 2000 barrels of rosin burned, requiring the combined efforts of the fire departments of several cities to protect surrounding property. Adjoining this shed was a small concrete building equipped with Fenestra steel window sash and wire glass panes. When the fire was eventually extinguished it was found that the Fenestra sash was apparently as good as when installed, and the only damage done to the building which it protected was the loss of a few panes of wire glass, which had been melted by the intense heat. This would indicate that windows or walls of Fenestra construction may be safely used in any ordinary exposure.

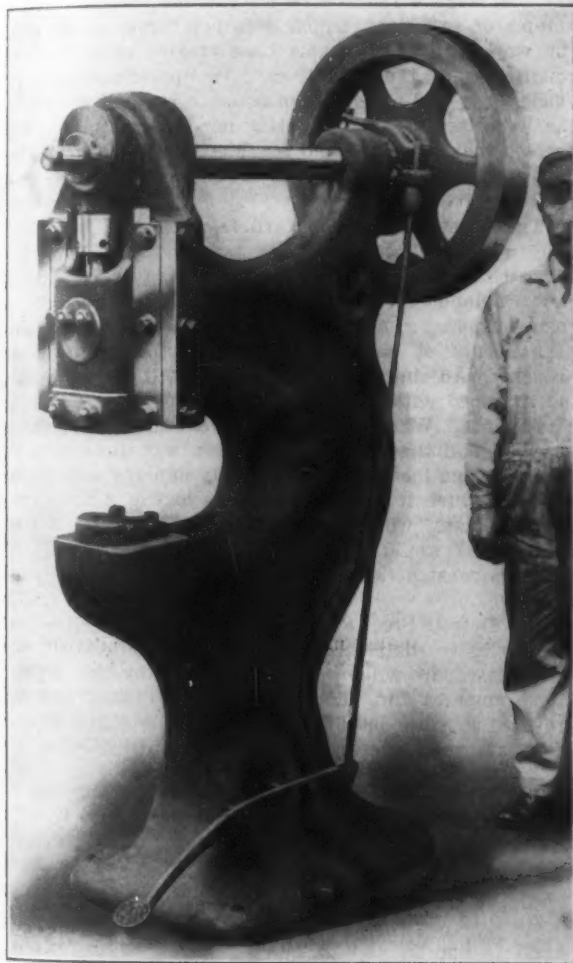
The Detroit Steel Products Company has just become the exclusive distributor in the United States for the metal casement windows manufactured by the Crittall Mfg. Company, Ltd., London, England. These windows are used in office buildings, banks, public buildings and high-class residences.

The Fafnir Bearing Company.—At the meeting of the incorporators of the Fafnir Bearing Company, held in New Britain, Conn., March 8, the following Board of Directors was elected: Howard S. Hart, president Hart & Cooley Company, formerly president of the Russell & Erwin Mfg. Company and Corbin Motor Vehicle Company; N. P. Cooley, treasurer Hart & Cooley Company; E. C. Goodwin, assistant treasurer and superintendent Hart & Cooley Company; E. A. Moore, second vice-president and superintendent Stanley Works; F. G. Vibberts, treasurer New Britain Trust Company; Judge James E. Cooper, corporation counsel for the city of New Britain; Elisha H. Cooper, formerly secretary and manager E. E. Hilliard Company, Buckland, Conn. The directors afterward elected the following officers: H. S. Hart, president; E. C. Goodwin, vice-president; E. H. Cooper, secretary and treasurer. The company is organized for the manufacture of a strictly high grade ball bearing in accordance with the best European practice. Nearly two years have been already spent in the study of foreign processes and in tests and experiments leading finally to the establishment of a factory in New Britain, which is now in operation in the plant of the Hart & Cooley Company. The organization of the new company will provide abundant means for the development of the new enterprise, not only in capital but in the well recognized business ability and experience represented in its board.

The E. & G. Brooke Iron Company, Birdsboro, Pa., resumed operations in its nail works and rolling mill department March 6, after being idle since February 1.

A Small Ferracut Punching and Riveting Press

A new line of presses for punching holes and forcing down rivets at a distance from the edge of a sheet has been placed on the market by the Ferracut Machine Company, Bridgeton, N. J. The frame is solid and well proportioned, and the section subjected to tensile stress is larger than that subjected to compression. A treadle controls the clutch on the press shaft, instantly starting it by connecting it to the constantly revolving flywheel. The ram goes down, makes a stroke and returns to the up position where it stops. The ordinary length of stroke is $1\frac{1}{2}$ in., but may be shorter or longer up to a maximum of $2\frac{1}{2}$ in. The ram is double gibbed and has a



The No. P-21 Press for Punching and Riveting Built by the Ferracut Machine Company, Bridgeton, N. J.

vertical adjustment of 3 in. The throat depth is 18 in., which allows considerable latitude in handling the work. The flywheel is 25 in. in diameter, 4 in. across the face and weighs about 275 lb. The shaft upon which the flywheel is keyed is forged from high carbon steel. The press illustrated is the smallest of the line and weighs about 2300 lb. The pressure which it is capable of exerting is approximately 15 tons. In addition to the narrow bed type, these presses are also built with gearing and wider beds.

A Large Order for Buffalo Fans.—The New Jersey Zinc Company recently placed an order with the Buffalo Forge Company, Buffalo, N. Y., for 54 large special fans. The order was placed after three or four different manufacturers had each been given an opportunity to install an experimental blower to be tested for efficiency under special but identical conditions. The Buffalo fan was found to make the best showing. An exceedingly high efficiency is claimed to have been obtained. In comparison with the fans already in use by the New Jersey Zinc Company, the Buffalo fan showed a saving

in power consumption of fully 30 per cent. This exceptional performance is ascribed to the accuracy with which the dimensions of inlet, outlet, length of blades, diameter of wheel, width, &c., were proportioned to meet the special conditions. It is estimated that the fans will make over eight carloads.

Italian Workmen's Insurance Prizes

By the Marchese di Cambiano, president of the International Prize Competition Committee of the International Exposition of Industry and Labor, Turin, 1911, the American Museum of Safety, New York, is informed that the Minister of Agriculture, Industry and Commerce and the National Board for Workmen's Insurance have offered the following prizes:

(A) \$2000 for the best experimental study on the groundings or connecting to earth in industrial electric plants. It must especially deal with: (a) the phenomena occurring when any point of the electric circuit comes into contact with the ground; (b) the influence of the nature and composition of the soil on such phenomena; (c) the influence of the form of the currents and their voltage on said phenomena; (d) the protective efficiency of the grounding or connecting to earth, whether permanent or consequent to phenomena of abnormal voltage; (e) by means of keeping and checking the groundings. The study may be written in Italian, French, English or German, each section to take into consideration both the industrial currents of the circuit and those caused by internal or external disturbances of the same circuit; the study and the provisions suggested therein to be accompanied by sufficient experimental data. This competition closes September 30.

(B) \$1000 offered by the Minister of Agriculture, Industry and Commerce for the best device for shifting a belt. It must be applicable to belts with a linear velocity of at least 18 metres (59 ft.), with a width of 100 to 150 millimetres (3.9 to 5.8 in.); it must be of comparatively cheap construction and installation; should occupy the least possible space and should be easily operated by a single workman. The apparatus must be submitted in working form, so that it may be submitted to practical and prolonged tests. This competition closes April 30, 1911.

(C) Another prize of \$1000 is offered by the same minister for a portable apparatus for moving belts and pulleys with different diameters and mounted on shafts with different diameters. Conditions are the same as for B. This competition closes April 30, 1911.

(D) A prize of \$500 is offered by the same minister for the prevention of accidents in connection with the working of cold metals and introducing between the cylinders of rolling mills lead, pewter, copper and brass plates and sheets. The safety device must be simple, strong and with no interference with the work, nor the subjection of the sheet to a second rolling between the same pair of cylinders. The apparatus is to be presented with the accompanying machine. This competition closes April 30, 1911.

(E) A prize of \$2500 is offered by the same minister for devices lessening the danger of carbuncular infection, to which tannery employees are subjected in carrying and tanning hides. The safety system must be such as not to alter the value of the hides and must be subjected to practical tests. The essay may be written in Italian, German, French or English. This competition closes September 30, 1911.

(F) A prize of \$1600 is offered by the National Fund for Workmen's Insurance for a device by which an electric line at a high potential may be cut out as soon as the conductor breaks. The apparatus required should be mounted on any electric or sub-station of the plant, and should not cause any important alteration or increase in the installation of the overhead wires; nor should it in any way disturb the working of the plant. This competition closes September 30, 1911.

Any further details desired will be furnished by the American Museum of Safety, 29 West Thirty-ninth street, New York.

The Newton Rotary Planer

A new type of rotary planing machine has been recently brought out by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa. This machine is especially adapted for rapid production in finishing cast iron and structural steel columns on both ends and one was recently furnished Joseph T. Ryerson & Son, Chicago, Ill., for use at their Boonton, N. J., warehouse. Fig. 1 is a front view of the machine, and

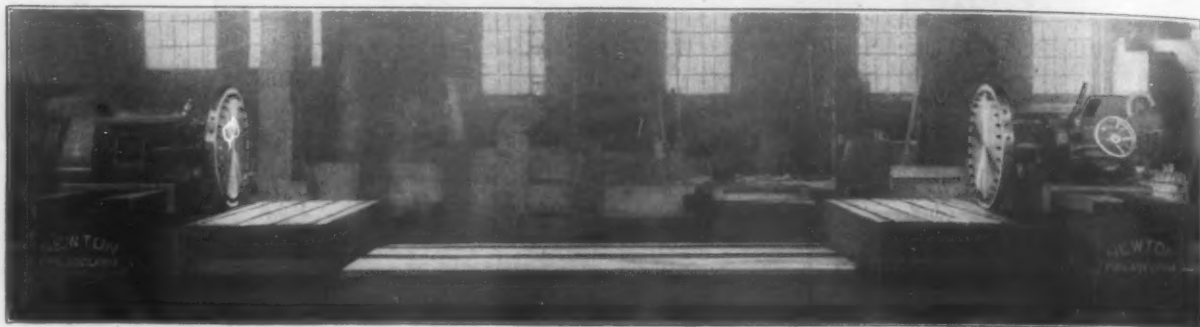


Fig. 1.—Front View of a New Rotary Planer Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

Fig. 2 shows the arrangement of the drive for the right head.

In the design of this machine the cutters were arranged to be pulled to the work, as this eliminates the chatter produced when the cutters are pushed. For this reason both right and left hand heads were used. The driving pinion is mounted immediately back of the cutting position of the tools, and as the motion for the feed is taken from opposite sides of the internal gear, the stresses are opposed and the tendency to chatter on the webs of structural work is overcome.

The cutter heads of all the machines are steel castings having angular slots cut from the solid for the reception of tools and a steel band shrunk on the periphery into which the tool retaining set screws are fitted. The internal driving face plate gear has the teeth cut from the solid and those of the driving pinion as well as those of the gears transmitting the feed are made in the same way. The large diameter spindles revolve

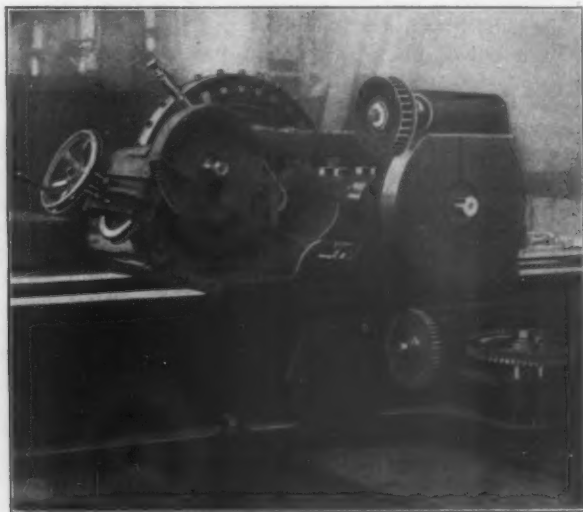


Fig. 2.—View Showing the Arrangement of the Drive for the Adjustable Head.

in capped bearings in the saddle which has a hand adjustment on the carriage for slight variations in the depth of the cut. An angular rack and spiral gears provide four geared changes for the cross feed to the heads which can be reversed as well as the fast power transverse. All the operating levers are mounted upon the saddle and travel with it. The saddles are provided with square locked gibbed bearings on the base with the underlocking gibs cast solid. Taper shoes provide a means for making adjustments, and the saddle bearings

extend the full length of the saddle and the full width of each shear.

Each head is driven by a $7\frac{1}{2}$ -hp. Westinghouse type S motor, operating at a speed of 975 rev. per min. Power is transmitted from the motor through spiral gears to the driving worm wheel, which is a bronze ring with teeth of steep lead. The driving worm is of hardened steel, and together with the worm wheel, is incased for lubrication, and both are provided with roller bearings where necessary. The machine at the left end, Fig. 1, is stationary, while the other machine can be ad-

justed to any distance from 6 ft. $3\frac{1}{4}$ in. to 30 ft., by a 5-hp. motor, mounted on the back of the base as shown in Fig. 2. Motion is transmitted from this motor through spiral gears to the worm wheel shaft, which meshes with the worm wheel, controlling the movement of the rack pinion.

The following table gives the principal dimensions and specifications of the planer:

Diameter of cutter head over tools, inches.....	26
Hand adjustment for each head, inches.....	$2\frac{1}{2}$
Cross feed to saddle, feet.....	5
Size of work tables, feet.....	3 x 6
Length of cross slide, feet.....	10
Maximum distance between faces of cutting tools, feet..	30
Minimum distance between faces of cutting tools, feet....	$6\frac{1}{4}$
Floor space, feet.....	37 x $5\frac{1}{4}$

A cutter grinding machine has also been developed to be used in conjunction with this planer. It is arranged to grind the tools in position and duplicate their length and contour, thus effecting a considerable saving in the idle time of the machine, as compared with former conditions, when it was necessary to remove the tools from the head for grinding.

The Congress of Technology

Roger W. Babson, well known as a statistician, will present before the Congress of Technology, to be held April 10 and 11, in Boston, Mass., a paper on the new profession of economic engineering. Mr. Babson would add to conservation and scientific management a training in the fundamental principles of economics, to the end that a scientific study of trade and financial conditions may be used in shaping the conduct and the expansion of our industries.

One of the newest problems in scientific management—namely, that of decreasing the present rising proportion of manufacturing burden to labor cost in factories—will be strikingly presented by J. B. Stanwood, vice-president and chief engineer, Houston, Stanwood & Gamble Company, Cincinnati.

Under the title, "The Conservation of Our Metal Resources," the heavy losses of metal occurring in some existing processes of metal production, and how these losses may be reduced or avoided, will be discussed in a paper by Albert E. Greene, electrometallurgist, American Electric Smelting & Engineering Company.

At a meeting recently held at the Institution of Mechanical Engineers, London, it was decided to form a London branch of the British Foundrymen's Association. The association has now nearly 700 members and branches have been established at Sheffield, Manchester, Glasgow and elsewhere.

New Tools and Appliances

This is essentially a news department for which information is invited.

Special Drilling, Tapping and Turning Machine.—The Rockford Drilling Machine Company, Rockford, Ill., has recently built a special machine for finishing the stands of ordinary force pumps at one setting. Fourteen operations in all, including boring, drilling, facing and tapping or threading, are performed in this machine in about 5 min. per casting as compared with from 40 to 50 min., which was the time required when this work was formerly done in the upright drill press. With this machine the castings are taken from the tumbling barrel and finished ready for the paint shop and the assembling floor. The machine is controlled from the front and the spindles can be adjusted to handle various sizes of castings.

A Three-Spindle Tapping Machine and Universal Jig.—The Rockford Drilling Machine Company, Rockford, Ill., has built a special three-spindle tapping machine to meet the requirements of one of its customers. The heads with which this machine is equipped differ considerably in size, thus enabling a variety of tapping operations to be performed. All of them have the maker's tapping attachment and are similar in construction to those used on his regular 14-in., 20-in. and 23-in. back geared machines. The tapping capacity ranges from 3-16 to 1¼ in. A special base is furnished upon which the work and a special universal jig are mounted. The latter is designed for use on a casting requiring holes to be tapped on every side. The double trunnion type of construction is employed and the work is attached to a bracket mounted on trunnions on an outer frame which in turn has trunnions in the supporting stand. In this way a universal adjustment is provided and to locate the casting for tapping the different holes at the proper angles positively and quickly each of the swiveling frames has an indexing plate containing as many holes as are needed for locating the work in the different positions. These holes are engaged by indexing pins, one of which is in the outer frame and the other in the supporting stand. This enables the casting to be held for the various operations without employing supporting blocks and it can be quickly and accurately adjusted to the different positions with but little effort on the part of the operator. When the casting is placed in the jig it remains in the same position relative to the inner work holding bracket until all the operations are completed. To enable the jig and the work to be readily removed to any desired position beneath the spindles of the tapping machine it is mounted on four casters, each of which is equipped with a ball bearing.

Perforating Machine.—Chronik Brothers, 73 Gold street, New York City, have developed and placed on the market a perforating machine which, although primarily intended for perforating moving picture films, where accurate spacing is required, can also be used for sheet metal work. The punches and the dies are movable in a longitudinal direction, and the amount of their travel is governed mechanically. The end of the film passes between presser feet and strippers attached to the receiving reel. The punches descend and perforate the film and immediately the presser feet are released. The main shaft in its movement holds the punches and dies together with the film between them, and all three are carried forward a predetermined amount. When this movement ceases the presser feet are forced into engagement with the film and hold it while the punches travel back to their former position.

A Vertical Keyseater with Motor Drive.—The No. 1 keyseater built by the Lapointe Machine Tool Company, Hudson, Mass., has been equipped with motor drive. The cutters used with this machine have from 10 to 20 teeth, and each one cuts 0.01 in. at each of the 16 strokes made per minute. On the return stroke the cutters automatically clear the work, thus avoiding drag. An index plate and a locked finger which is positive in action regulate the depth of the keyway, the feeding being entirely automatic. The machine when equipped with a 2-hp. motor weighs about 975 lb., and occupies a floor space of 36 x 40 in.

Adjustable Shop Stand. For saving time in handling machinery to be built or rebuilt and especially automobile engines the Standard Motor Car Company, Scranton, Pa., is building a shop stand. This new piece of equipment is adjustable to accommodate various widths of machines and contains a tilting and reversible table, which can be locked in either position and also when the stand has been set to the desired width. An automobile engine can be clamped in position and after the cylinder, commutator, carbureter, water pump and other parts on the upper half have been dismantled, the two locking pins can be disengaged and the engine turned over without removing it from the stand so that the lower half of the crank case and the fly wheel can be disassembled.

A New Cylinder Grinder. The cylinder grinding machine built by the Brown & Sharpe Mfg. Company, Providence, R. I., has been redesigned so that the grinding spindle travels in a circular path and the cylinder remains stationary. This is a very desirable feature in grinding cylinders where the weight is not distributed uniformly around a central axis. The head is thoroughly inclosed to prevent the entrance of dirt and to protect the operator, and the table travels under it. A belt from a swinging floor stand drives the spindle and also cares for the rotary motion due to its travel. Another special feature of the grinder is the exhaust fan, hose and receiver which is an integral part of the machine and makes it independent of the general exhaust system of the shop. This tends to improve the quality of the work and also the health of the operator. The maximum size of cylinder handled by this grinder is one having a 7-in. bore and a 4-in. stroke.

Combination Tool Room Furnace. The Rockwell Furnace Company, New York City, is manufacturing a furnace for heat treating a variety of small tools made from both high speed and carbon steels, where accurate temperatures are required. An entrance in the end of the furnace enables it to be used for end heating, while an opening in the front makes it available as an oven furnace. For hardening high speed steel tools, the muffle and the bottom tiles are removed and tools up to 8 in. long can be suspended in the heating chamber. For lead hardening and oil and sand tempering, an iron pot can be placed in the entrance in the top of the furnace. The furnace is made of cast iron throughout and is lined with fire tile. It occupies a floor space 16 in. square and is 3 ft. 10½ in. high.

Motor Driven Turret Lathe.—A motor driven geared head turret lathe in which the convenience of control has received special attention has been brought out by Bardon & Oliver, Cleveland, Ohio. The equipment of the tool includes an automatic chuck, wire feed, power feeds to the turret and the cross slide and an automatic throw out for the cross and the longitudinal feeding movements. Two mechanical speed changes having a ratio of about 3½ to 1 are provided and these with an adjustable speed motor having a variation of 3 to 1 give a total range of about 10 to 1. Friction clutches on the spindle provide a reverse speed mechanically and all the mechanical changes in either direction are secured by operating two vertical levers on the headstock. One of the special features of the lathe is the method of reversing the spindle. The reverse gear is mounted on the spindle, which is not only the slowest running member of the driving train but is also the only part reversed, all the other parts continuing to run in the same direction for either movement of the spindle.

Boring and Facing Mill.—A new machine which is adapted for both milling and boring operations is now being built by the Burke Machinery Company, Conneaut, Ohio. Milling cutters can be mounted on the horizontal spindle, which is also fitted for driving boring bars. The work table is mounted on a large base made in two sections and joined by angular ways. The vertical adjustment is effected by an angular screw and when the desired height is secured the two members of the supporting base are rigidly locked by bolts passing through elongated slots in the ways. Power cross and longitudinal feeds are provided for the table and are conveniently controlled by hand wheels. The spindle is driven by powerful gears and the feeding and the driving gears are all inclosed by the frame, thus affording protection to the operator and giving a very rigid design.

The Machinery Markets

An apparent irregularity in the machinery demand exists. Inquiries have fallen off in New York, but orders continue fairly good and the trade is cheered by the announcement that the United States Steel Corporation intends to spend about \$300,000, principally for machine tools. The demand from the railroads is not so heavy, and New England machinery dealers are interested in the announcement that the New York, New Haven & Hartford Railroad Company intends to curtail its expenses. The automobile show in Boston has brought some business to New England and the demand for textile machinery has improved. A betterment is noticed in Cincinnati, where makers of mechanical electrical equipment are busy, and there is a good call for woodworking machinery. Small orders are being placed in the Cleveland market in good volume, and a better demand for forging equipment and automatic screw machines and drilling machinery is noted. In Chicago the Power Mining & Machinery Company is out with a small list, and the Rock Island Railroad is asking for bids on about \$7000 worth of equipment. Machinery men on the Pacific Coast are active and logging camp requirements are attracting attention. Donkey engines and mill supplies for that industry are selling well. Trade is quieter in the South, although quarrying and crushing machinery is selling well. Increased mining developments in Texas are keeping business on a satisfactory basis there, and the only effect of the Mexican disturbances is that transportation facilities to mining camps are somewhat tied up. The export business is still contributing generously to the support of the market, and the requisitions for machine tools for export are especially heavy.

New York

NEW YORK, March 15, 1911.

The volume of inquiries has not been so heavy in the last few days as it was a week ago, but orders are coming in freely for a general line of mechanical equipment. Railroad buying for the time has ceased and there are no new inquiries out even for machines for replacement. The Ontario & Western Railroad continues to hold off in making purchases against the large list which has been out several weeks, but machinery men who have bid against the inquiries have been assured that the purchases will be made. It will be remembered that the General Electric Company, through the Pennsylvania Electric Company, asked for bids on a large list of requirements about four months ago for installation at Erie, Pa. The company took no further action in the matter until late in February when the list was pretty well cut. Since then some more cutting has been done, but notwithstanding the apparent retrenchment the list as it now stands still calls for heavy expenditures. Judging from the company's renewed activity in the matter it is expected that purchases will be made against the curtailed list in the near future. The United States Steel Corporation, through the Carnegie Steel Company and the American Steel & Wire Company, has been making scattered inquiries for a line of machinery, principally in the way of machine tools. It is stated that the company expects to spend about \$300,000 for machinery to be added to the plants of its subsidiary corporations. Nothing like a list has yet appeared, but several machinery houses in New York have received extensive inquiries from the Steel Corporation. Manufacturers of small power units are getting some good business at this time, principally for power plants for office buildings and large apartment houses in Long Island and New Jersey. The building business is not very brisk in New York, but in nearby cities there are some good contracts pending in this line.

The Newark Automobile Mfg. Company has been organized at Newark, N. J., to make light delivery automobile cars, and ground has been bought on Frelinghuysen avenue, on which there are a number of buildings which will be reconstructed and enlarged. The company proposes to equip a complete plant for the manufacture of motor cars and delivery wagons, a feature of the construction of which will be the placing of the transmission and differential on the rear axle of the vehicle in one gear box. The company has had a sample car built in Detroit and it is claimed that there are 150 less parts used in the Newark car, as it is to be called, than in any other car, but has the same number of reverse and forward speeds. C. G. Paul, who is at the head of the enterprise, has established temporary offices in the Continental Hotel at Newark.

Newark, N. J., is rapidly becoming an automobile center, particularly in the manufacture of motor trucks and automobile bodies. The city is also a state center for automobile repair work and New York machine tool men have done some good business there during the last few months in filling orders for repair shops and garages. Among the new enterprises of this kind planned in Newark is the erection of a repair plant and garage for the Ellis Motor Car Company,

which will be built at Central avenue and Second street. The building will cost \$25,000 and will be equipped with a full line of repair equipment. The Christian Feigenspan Corporation will build a garage and repair shop at 206 Passaic avenue, Newark, which will be one story, 76 x 115 ft. The structure will cost \$20,000 and in addition to affording housing facilities for 50 large automobile trucks, repair equipment will be installed to take care of the vehicles.

The Kennedy Mfg. & Engineering Company has been organized with offices at 120 Liberty street, New York, to manufacture mining, cement making machinery and supplies. The company will not build its own plant as yet, but will have its product manufactured to order.

The International Slot Machine Company, 54 Nassau street, New York, has been organized with an authorized capital stock of \$100,000 to make automatic machinery. The company proposes to let its manufacturing work out by contract for a time.

The Georgian Mfg. Company, Binghamton, N. Y., is making additions to its plant, including a blacksmith shop, a core room and a test car store house, all of concrete and brick.

Plans and specifications have been prepared for the Board of Water Commissioners, Niagara Falls, N. Y., for the construction of a new water works system to cost approximately \$250,000. William D. Robins is city engineer.

The city of Buffalo, N. Y., has introduced a bill in the New York State Legislature authorizing the issue of bonds for \$200,000 for the establishment of a municipal electric lighting plant at the new waterworks pumping station at the foot of Porter avenue; the money to be used for the purchase of three turbine electric generators. Francis G. Ward, Commissioner of Public Works, will advertise for bids.

The United States Government will establish and equip a new light and fog signal station at the north end of the breakwater, Buffalo harbor entrance, for which an appropriation of \$60,000 was provided by Congress at its last session.

The Steel Conduit Company has been incorporated with a capital stock of \$150,000 at Penn Yan, N. Y., to manufacture electrical conduits and insulating devices. The incorporators are W. T. Morris, H. M. Short and E. R. Ramsay, Penn Yan.

The Ox fibre Brush Company, Frederick, Md., has purchased a site of six acres for a new manufacturing plant at Albany, N. Y., on Broadway near Ferry street. Plans are being prepared for a three-story reinforced concrete building 80 x 400 ft. which will be erected at once as the first of a series of manufacturing buildings of which the plant will be comprised.

The National Tanners' Supply Company, Buffalo, N. Y., recently incorporated with a capital stock of \$250,000, will establish a plant for the manufacture of tanning oils, dyes and tanners' supplies of all kinds. H. Sloan, W. Brereton and D. Bunchaft, Buffalo, are the incorporators.

The large machine shop additions to the plant of the American District Steam Company at North Tonawanda, N. Y., and its new general office building there are nearing completion and as soon as finished the company's machine shops and main offices, now located at Lockport, N. Y., will be moved to North Tonawanda.

The New York Central Iron Works, Geneva, N. Y., has about completed arrangements for building a new plant at Hagerstown, Md. Plans for the proposed plant have not

THE MACHINERY MARKETS

been prepared as yet and the machinery details are to be arranged later.

Catalogues Wanted

The Union Iron Works, Hill and Burnett streets, Houston, Texas, desires catalogues of manufacturers of oil feed boilers and engines with a view to making agency connections.

Philadelphia

PHILADELPHIA, PA., March 13, 1911.

Merchants and manufacturers report continued irregularity in the demand. In instances a trifle better inquiry for tools of the heavier types is noted, but there is still a lack of buying in any quantity, transactions being confined largely to single tool propositions. Some industrial concerns are ordering supplies more liberally, due to gradually increasing activity, but conservatism prevails when it comes to placing orders for any quantity of machine tool equipment. Special tools and machinery have been a shade more active, as requirements along special lines increase, a number of the smaller shops being pretty fully engaged on work of that character. A moderate increase in the demand for machinery castings is reported by foundries making a specialty of work of that character, but the betterment has not been sufficient as yet to have any general effect on the productive rate. The railroad demand has been practically at a standstill for the past few weeks. It is said that lists of requirements from the various shops have been prepared for some time but prospective purchases still lack authorization. A scattered demand for second-hand machinery is reported; the range of inquiry is somewhat more general and sales are less active than they were a few weeks ago. The market for boilers is fair but that for engines of moderate capacity continues dull, while very little has been done in power equipment of the heavier type.

Edwin J. Rooksby, who for a number of years has been a member of the firm of H. B. Underwood & Co., manufacturers of special tools for railroad repair and general machine shops, has withdrawn. The business will be conducted as heretofore by the remaining partners, Morris G. Condon, Albert D. Pedrick, Howard A. Pedrick and Daniel W. Pedrick, Sr., under the old firm name, H. B. Underwood & Co.

Paul Richardson, who for a number of years was connected with the selling forces of the Fairbanks Company in this city, particularly in the scale and general sales department, is now associated in a like capacity with the local branch of the Standard Scale & Supply Company, 35 South Fourth street.

Fire destroyed the machine shop of W. D. Haines, manufacturer of the Haines farming machinery, Haddonfield, N. J., on March 6. Plans have been made for temporary quarters and the rebuilding of the shop will be deferred until later in the season. The loss by the fire is said to have been about \$5000.

The Industrial Supply & Equipment Company has added several important lines and reports business as being somewhat improved. This company has been appointed exclusive selling agent for the Johnson hopper door, under patents of St. Clair J. Johnson, for application on cars of all classes. It also has the agency for the territory east of Ohio and extending along the Atlantic Coast, for the D. & L. Throttle rod stuffing box and plunger plastic packing, manufactured by the Union Machine Company, St. Paul, Minn.

George W. Garrett & Sons, wagon builders, 3908 Spring Garden street, are taking bids for an additional manufacturing building, 50 x 107 ft., three stories, to be erected at 3002-3006 Spring Garden street, for general work in connection with the building of wagons. Requirements in the way of power equipment and machinery have not yet been decided upon. The new plant when completed will increase the manufacturing capacity of the concern fully one-third.

Otto C. Wolf, architect and engineer, is preparing plans for a manufacturing building to be erected for F. X. Zirkilton, at Twelfth and St. James streets. The new building, which is to be used to a considerable extent for the manufacture of jewelry, will be 47 x 182 ft., five stories, and alternate bids on a concrete and a steel and brick structure will be asked.

It is stated that subbids are being taken by the Harrisburg Mfg. & Boiler Company, Harrisburg, Pa., for a one story machine shop, 400 x 600 ft. Particulars are not obtainable at this time.

The Commissioners of the District of Columbia, Washington, D. C., are receiving bids for the erection of a manual training school building at Wisconsin avenue and Thirty-

third street, in that city. The building programme is under the direction of C. H. Rudolf, John A. Johnson and William V. Judson, commissioners. Plans are by the Engineering Department of the district, 427 District Building, Washington, D. C.

Bids for the widening of Chestnut Street Bridge, in this city, opened by the Highway Department a few days ago, were found to be in excess of the appropriation, \$90,000. Bids ranged from \$108,600 to \$135,000, and specifications will have to be withdrawn and new bids asked.

Contractors are estimating on a new loft building, for light manufacturing purposes, to be erected at 1427 to 1433 Vine street for L. A. Belmont, on the site of the warehouse destroyed by fire several months ago. Plans call for a concrete building, 72 x 125 ft., with all modern conveniences.

A contract is reported closed for an extension of the Stroudsburg & Water Gap Railway, connecting Water Gap and Portland, Pa., a distance of five miles. E. P. Arbogast is said to have the contract and the cost for the roadway work and other improvements is stated as being \$80,000. This extension will form the last link in the electric service between this city and Delaware Water Gap, Pa.

A dispatch from Scranton, Pa., states that the Scranton Electric Company has announced its plans for the expenditure of \$1,000,000 to modernize its power plant. These include the making of steam and electricity at central plants, which will be located in the suburbs at Green Ridge and at its plant on the Lackawanna River. A new plant for the generating of electricity at Carbondale, Pa., is included. Particulars regarding the reported plans of the company are not available at this time.

The borough of Bristol, Bucks County, Pa., will open bids March 20 for a sewerage system and water works. William H. Boardman, 428 Walnut street, Philadelphia, is consulting engineer for the sewerage and disposal plant, which will require considerable mechanical equipment, including engines, pumps and boilers. J. M. Whitham, 607 Bullitt Building, Philadelphia, is consulting engineer for the water works, which will include a filter plant with a capacity of 2,000,000 gal., a water tower with a capacity of 150,000,000 gal., pumping station and power house.

Chicago

CHICAGO, ILL., March 14, 1911.

A general quietness prevails in the local machinery market. Inquiries are small and infrequent. Last year at this period automobile industries were ordering freely and with the fair volume from small manufacturers business was in better condition. This season most automobile manufacturers are restricting their purchases to bare necessities of the day. A feeling that this retrenchment has been overdone prevails in some quarters and as the activities of spring produce buyers this condition is expected to mend. The good crop conditions of the Mississippi Valley last year are looked upon as being advantageous to automobile business in the smaller towns and cities. The Power Mining & Machinery Company, Cudahy, Wis., is out with a list approximating \$5,000 and the Rock Island Railway Company with one amounting to about \$7,000. Floor sales are reported to be fair by local machinery houses, but no large inquiries are afloat.

The Parmelee Wrench Company, Chicago, has increased its capital stock from \$2,500 to \$10,000, and is installing new machinery which will enable it to triple its output.

The Reliance Mill-Work Company, Chicago, has purchased a tract of ground at Gary, Ind., upon which it will erect a warehouse and factory building in the near future, to be equipped with wood working machinery.

The Havana-American Tobacco Company, a branch of the American Tobacco Company of New York, will erect a manufacturing building at a cost of \$175,000 on West Twelfth street, between Robey and Lincoln streets, Chicago. The building will be 112 x 456 ft. and will be equipped with a mechanical ventilating system. Plans for the building were prepared by George C. Nimmons of this city.

The Moline Pressed Steel Company, Moline, Ill., has increased its capital stock from \$25,000 to \$50,000 and will double the capacity of its plant.

The Root & VanDervoort Engineering Company, Moline, Ill., has under construction a machine shop adjoining its foundry which will greatly facilitate work when completed.

The Excel Mfg. Company, Rockford, Ill., furniture, will in the near future hold a meeting to consider an increase in its capital stock from \$20,000 to \$50,000, the increase to be used to extend its business.

The city of Lincoln, Ill., has under consideration the installation of a municipal lighting plant.

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The Perfect Stove & Mfg. Company, Belleville, Ill., has been incorporated with a capital stock of \$10,000. The incorporators are A. B. Deeb, Paul Moeller and Charles Webb. The company will engage in the manufacture of stoves and ranges.

The plant of the Aviston Condensed Milk Company at Aviston, Ill., was practically destroyed by fire March 5. The loss is estimated at \$50,000. The insurance is \$22,500.

The Hamilton Lumber & Mill Company, Hamilton, Ill., has increased its capital stock from \$22,000 to \$40,000.

Hillsboro, Ill., has secured a new enterprise, a zinc smelter. Options on 43,000 acres of coal lands were secured six miles southwest of Hillsboro, by H. S. Hargrove and Frank Brown, who sold the options to Wm. Lanyon, a St. Louis capitalist, who intends to develop them for his own use in smelting zinc. The smelter will cover 30 acres, and 12 or more buildings will be erected.

Cincinnati

CINCINNATI, OHIO, March 14, 1911.

Inquiries and orders for machine tools from the South and the Pacific Coast now lead other sections of the country. Business is still improving, but is not yet what it should be. Machine tool builders are not now laying off any men, nor are they taking on any new operatives.

Manufacturers of electrical equipment are very busy, and at least one local factory has had to make some extra night runs. Woodworking and saw mill machinery also continues to show some improvement.

Increased attention is being paid to the export trade. One lathe builder, who in former years rarely received an export order, now reports fully 15 per cent. of its output as going to foreign countries, with a steady improvement shown each month.

On March 9 fire destroyed the plant and salesrooms of the Murdock Mfg. Company, Cincinnati, manufacturer and dealer in plumbing supplies. The loss is estimated at about \$50,000, partially covered by insurance. The company has leased temporary quarters on Sycamore street, near Ninth. Its plant will be rebuilt without delay.

The new Mechanics Institute building, Cincinnati, is now under cover, and the interior finishing work is being rushed all possible.

The Means Engineering & Foundry Company, Toronto, Ohio, has increased its capital stock from \$50,000 to \$75,000.

The Findlay Motor Company, Findlay, Ohio, announces an increase in its capital stock from \$300,000 to \$400,000.

The Ahrens Iron Works Company is a new Cincinnati incorporation with \$100,000 capital stock, and it is rumored that this company will soon take over the Union Iron Works plant on Colerain avenue. The incorporators of the new company are Robert Puff, Otto Loesche, John C. Hermann, A. E. Otte, Jr., and G. F. Ahrens.

The Atwood Wrench, Tool & Mfg. Company has been incorporated at Conneaut, Ohio, by William Atwood and others.

The executive committee of the Cincinnati Branch, National Metal Trades Association, held a meeting March 9 and completed arrangements for attending the annual convention to be held in New York in April. Members from Cincinnati and vicinity will travel in special cars over the Pennsylvania Railroad.

The plant of the United States Carriage Company, Columbus, Ohio, suffered a \$20,000 fire loss last week. Repairs are already under way.

Rapp, Zettel & Rapp, architects, Johnston Building, Cincinnati, have drawn up plans for an addition to the plant of the Cincinnati Milling Machine Company, in Oakley. The improvements will add about 75,000 sq. ft. of floor space to the factory in question, and will be constructed of brick, steel and concrete.

The J. A. Fay & Eagan Company, Cincinnati, manufacturer of sawmill and woodworking machinery, has consolidated its Chattanooga, Tenn., Greensboro, N. C., and Atlanta, Ga., offices, and the latter point has been selected as headquarters for handling business in that territory.

The Williams Shoe Company, Cincinnati, has more than doubled its capital stock, and will, in the near future, make some large additions to its shoe factory.

It is reported that the Packers Motor Car Works, Pittsburgh, Pa., is negotiating for a site at Glenova, W. Va., on which it will erect a plant for the manufacture of automobiles and auto trucks.

There is a rumor, that cannot now be confirmed, that the Proctor & Gamble Company, Ivorydale, Ohio, has completed plans for erecting a 100-ton cottonseed oil mill and refinery at Memphis, Tenn.

New England

BOSTON, MASS., March 14, 1911.

The trade will watch with some anxiety the results of the announcement of the New York, New Haven & Hartford Railroad that it proposes to curtail expenditures. A vast amount of new work is projected, including that of the Boston & Maine system, with the new shops, for which great amounts of machinery will be required. Many of the improvements are considered absolutely necessary, and it is not supposed that a postponement will follow. The Automobile Show last week contained many elements of encouragement for this trade. The machinery dealers found February a fair month; this is always one of the dull months of the year in many branches of industry. The machine tool builders are accumulating stocks. Seldom has the industry gone ahead in preparing for a future market with such confidence. When the tide of demand sets in the market will be exceptionally well supplied in most lines of tools. A very hopeful factor is the improvement in the textile machinery business, which has been dull for some time. Manufacturers of repair parts are feeling a very decided change for the better, and the great manufacturers of this class of machinery are busier than they have been for a year.

The Union Caliper Company, Fitchburg, Mass., has purchased the business of the Hill Tool Company, Anderson, Ind., and the industries will be consolidated in a new plant at Orange, Mass. The Union Caliper Company manufactures a line of machinists' small tools, including calipers, scales and kindred appliances, while the Hill Company makes a line of tool holders, for use with lathes, planers and other machinery. A modern building, admirably suited to the purposes of the industry, has been secured at Orange, and the work of removing the Fitchburg factory will begin immediately. When this has been completed the equipment and stock of the Anderson factory will be taken to Orange. Both of the consolidated companies require additional manufacturing facilities, and the new location will accomplish the desired end. Some new equipment will be needed later, but just what is not yet known. The present shops have considerable modern machinery. New tools will be used to balance the equipment, to give a maximum of productive capacity. Emory E. Ellis is president of the Union Caliper Company, and M. D. Johnson the treasurer, both being residents of Fitchburg.

The Barker Company, Pine Island, Norwalk, Conn., manufacturer of gasoline engines, will erect an addition to its works, 30 x 140 ft.

Additions to general manufacturing facilities include the following: M. J. Riordan, Norwalk, Conn., woodworking shop, 35 x 60 ft., three stories; Omo Company, Middletown, Conn., dress shields, one-story addition, 40 x 240 ft.; Gaynor-Mitchell Company, Bridgeport, Conn., addition contemplated.

The Massachusetts Saw Works, Chicopee, Mass., has awarded the contract for a new factory to be located at the corner of Fiske and Roland avenues, in the Brightwood section of Springfield, Mass. The main building will be 70 x 170 ft., two stories, with a one-story wing, 60 x 80 ft. A building to house the engine and gas producer plant will be 30 x 50 ft. The plant will be of brick, mill construction.

The Bay State Tap & Die Company, Mansfield, Mass., manufacturer of screw cutting tools, which suffered a loss of \$8000 by fire February 26, has made repairs so that the factory is now running at full capacity. It will be necessary to rebuild only a small part of the works.

The Lynn Machine Company, 523 Union street, Lynn, Mass., has been organized to carry on a machine shop making a specialty of repairs.

The stockholders of the Chapman Valve Mfg. Company, Indian Orchard, Mass., have voted to accept the recommendation of the Board of Directors for a financial reorganization, by which the corporation will be capitalized for \$1,000,000, equally divided between common and preferred stock, an increase of preferred stock of \$200,000, but a decrease in common stock from \$1,000,000 to \$500,000. The stockholders were practically unanimous in their action, which will put the finances of the business on a most substantial basis.

The last of rapidly succeeding railroad changes in New England is the acquiring by the Boston & Maine system, through the controlling corporation, the New York, New Haven & Hartford, of the Montpelier & Wells River Railroad, the Barre Railroad and the Barre Railway. These purchases have important connection with the recent acquisition of rights in the Rutland Railroad. The Montpelier & Vermont connects the two places from which it is named, a distance of 45 miles, together with a seven-mile branch to Barre. The Barre Railroad and Barre Railway are shorter lines, operating in the quarry country.

The report is revived that the Vermont Central, or its

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lessee, the Grand Trunk, will build modern repair shops at the southern end of the system. The need of largely increased shop facilities will be accentuated when the new line from Palmer, Mass., to Providence, R. I., is completed within the next two years. The Vermont Central has had plans for large improvements in repair shops for some time, but has not acted definitely in the matter to date.

An increase in the capital stock of the Lockwood Mfg. Company, South Norwalk, Conn., builders' hardware, is for the purpose of putting surplus into capital. The management states that no enlargement of the plant or business is contemplated at this time.

The Marine Specialty Company, Inc., Norwich, Conn., has been incorporated in Connecticut, with capital stock of \$4000, to manufacture marine indicators and other instruments. The incorporators are Charles H. Kenney, New London, and Frank H. Allen and Archibald Mitchell, Jr., Norwich. The company states that no factory will be established at present, but that the products will be made by outside parties.

The Hutchinson Vacuum Cleaner Company, Bridgeport, Conn., has been incorporated in Connecticut to manufacture a low priced vacuum cleaner, which will retail for \$5. It will be manufactured by the R. P. K. Pressed Metal Company, Bridgeport, and marketed from the New York office of that corporation, under the direction of the Vacuum Cleaner Company. Charles G. Hutchinson is president; A. L. Ruland, vice-president, and Howard McK. Kirkland, secretary and treasurer.

The addition to the works of the Union Twist Drill Company, Athol, Mass., mentioned in last week's issue, will be used to take care of the increased business of the cutter department.

The Springfield Foundry Company, Springfield, Mass., states in connection with its new works, that they will be run strictly as a jobbing foundry and will make a high grade of gray iron castings. The structure will be 100 x 150 ft.

The Boston Automobile Show was a surprise in the great attendance, which exceeded that of the 1910 show, and in the number of orders for cars placed with exhibitors. The industry apparently received much encouragement from direct results, as well as from large promises of indirect results a little later in the season. A certainty exists that there will be a shortage of certain makes of cars. The show had no extended exhibits of machinery or appliances used in the manufacture of cars. The Norton Company, Worcester, Mass., showed its line of abrasive wheels and materials, including its new Crystolon, the Norton Carborundum. The Norton Grinding Company, Worcester, had in operation its cam grinding machine and machine for procuring a running balance of cylindrical parts. The Chandler & Farquhar Company, Boston, occupied its usual space, showing in operation a 5-ft. full universal high-speed radial drill and a 3-ft. sensitive drilling machine of the American Tool Works, Cincinnati; the improved cold saw and saw sharpening machine of the Cochrane-Bly Company, Rochester, N. Y.; the ball bearing disc grinder of the Rowbottom Machine Company, Waterbury, Conn.; the combination milling and drilling machine of the W. B. Knight Machinery Company, St. Louis, and the gear cutter of the Standard Machinery Company, Bridgeport, Conn. A machine in the Chandler & Farquhar exhibit which attracted a good deal of attention was a new type of ball bearing high duty polishing and buffing machine, which has just been brought out by the Central Autogenous Welding Company, Worcester, Mass.

The saw shop of the West Haven Mfg. Company, West Haven, Conn., was destroyed by fire March 8. Other parts of the plant were saved and the company is able to continue its manufacturing and fill orders.

Milwaukee and the Northwest

The Miller Brewing Company, Milwaukee, Wis., is erecting an addition to its boiler house 50 x 75 ft., two stories, in which it will install three new boilers. An iron smoke stack 150 ft. high will also be erected.

The Davis Mfg. Company, Milwaukee, Wis., manufacturers of gasoline engines, is considering the erection of a testing room. The company states that it is buying a few tools, but is not in the market for any special class of equipment at the present time.

The Lewiston Brick & Tile Mfg. Company, Lewiston, Mont., incorporated with \$75,000 capital stock, has plans prepared for the construction of a brick and tile plant.

The St. Paul Foundry Company, St. Paul, Minn., has under consideration the erection of additions to its plant, definite plans for which will be decided upon at its annual meeting, to be held some time in April.

The Northern Cold Storage & Warehouse Company, Duluth, Minn., is erecting a new warehouse, 100 x 100 ft.,

in which will be installed an electric elevator of 6000 lbs. capacity.

The Gas Traction Company, Minneapolis, Minn., will commence work as soon as the frost is out of the ground on a new office building, 40 x 100 ft., two stories. The present office room will be used for increasing the machinery equipment.

The Kinnard-Haines Company, Minneapolis, Minn., gasoline engines, has under consideration the erection of an assembling building, 60 x 200 ft., during the fall of 1911.

The Segerstrom Piano Mfg. Company, Minneapolis, Minn., is contemplating the erection this spring of a factory to contain about 50,000 sq. ft. of floor space. Considerable new equipment will be purchased, all of which will be operated by electric power, with individual motors.

The Moore Boat Works, Wayzata, Minn., is contemplating the erection of a steel boat house, 75 x 150 ft., two stories, to be arranged with tracks, and equipped with elevators for the handling of boats and launches.

A water works system to cost \$10,000 will be established by the City Council of Cuyuna, Minn.

The Manchester Light, Heat & Power Company, Manchester, Iowa, will enlarge its plant by the installation of an additional engine and dynamo.

Roland, Iowa, is having estimates prepared for an electric light plant to be constructed at a cost of \$8,000.

The Waterloo Chemical Works, Waterloo, Iowa, is erecting a new factory, 40 x 150 ft., two stories and basement, which it will equip with modern machinery. A steam heating plant will be installed, and arranged, so that the steam may also be used for power and glueing purposes. Tanks for the storage of gasoline and kerosene will be erected. Many of the improvements have not been definitely decided upon, and contracts for the equipment have not been placed. The company is considering the use of motive power.

It is reported that the Sioux City Foundry & Mfg. Company, Sioux City, Iowa, is to be reorganized, and its capital stock increased from \$60,000 to \$150,000. It is the intention of the company to manufacture a gasoline tractor, invented by H. H. Bochman, Holstein, Iowa.

The Independent Mfg. Company, Waterloo, Iowa, has been incorporated with \$10,000 authorized capital stock, and will engage in the manufacture of agricultural implements, tools, &c. The officers of the company are: President, A. C. Ryan; Secretary, H. W. Christoph; Treasurer, J. C. Farr.

Cleveland

CLEVELAND, OHIO, March 14, 1911.

Some of the local machine tool builders report an improvement in the volume of orders and inquiries. Makers of forging machinery, drilling machines and automatic screw machines find the demand better than a few weeks ago. With the machinery dealers there is very little change in the situation. They are getting a moderate volume of orders for single tools and lots of three and four in small and medium sizes. Much of the business is coming from small new concerns that are starting to manufacture automobile accessories or small specialties. Some business is coming from the automobile manufacturers, but it is largely in the line of special tools. The improved condition of the automobile trade is noticed by the manufacturers of automobile parts, many plants engaged in this class of work now being well filled with orders. In electrical equipment the demand for small motors is quite active, showing considerable improvement.

Conditions are improving in the foundry trade, some of the light gray foundries now being fairly well filled with work.

The controlling interest in the Novelty Iron Company, Canton, Ohio, has been sold to George E. Downe and Eastern associates, and the company has been reorganized by the election of the following officers: President, Huntley Gordon, Boston, Mass.; vice-president and general sales manager, George E. Downe, Canton; secretary and treasurer, H. H. Bryan, Johnstown, Pa. The directors include the officers and William Sherlock, D. R. McCallum, Sol Torenaki and J. J. Grant. The company manufactures hot water and steam boilers and radiators.

The Bowling Green Motor Car Company, Bowling Green, Ohio, has been incorporated with a capital stock of \$100,000 to manufacture light delivery trucks. The company will occupy the plant in that city formerly occupied by the Gramm Motor Car Company. The incorporators are Stanley F. Sawyer, John B. Wilson, F. C. Moore, F. L. Rouch, J. W. Underwood and T. J. Miller.

Finding the present capacity of its plant too small to keep up with orders, the O. O. Poorman Company, New Bremen, Ohio, has decided to increase its capital stock from

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\$30,000 to \$50,000. The additional capital will be used in erecting another factory building and equipping it with machinery.

The Zeroze Mfg. Company, Cleveland, Ohio, has been incorporated with a capital stock of \$400,000, to manufacture glass-lined tin cans. A one-story factory building, 75 x 300 ft., will be erected. The company has established offices at 522 Rockefeller Building. The officers are: President, L. R. Steel; vice-president, S. C. Clark; secretary and treasurer, John D. Lloyd.

The Board of Trustees of Public Affairs, Andover, Ohio, will receive bids March 30 for the construction of a water works system. The specifications call for about 20,000 ft. of 4 to 8 in. pipe, 35 hydrants, 24 grate valves, and a 60,000-gal. tank on a steel tower.

The Board of Trustees of Public Affairs, Lakewood, Ohio, will receive bids April 4 for the erection of a steel water tower. Plans are on file at the office of the W. H. Evers Engineering Company, The Arcade, Cleveland.

The Steel Products Company, recently organized at Columbus, Ohio, has leased the steel castings plant at Plain City, Ohio, and is now operating it.

The Ragan-Brown-Lange Company, a new concern, has purchased the plant of the Napoleon Mfg. Company, Napoleon, Ohio, and expects to place it in operation shortly, the nature of the products not yet being made public. It is stated that a foundry will be built and some new machinery installed.

The McLean Lock Wrench Company, Cleveland, has been incorporated with a capital stock of \$15,000 by John C. McLean, C. H. Knight and others. The company is planning the starting of a factory for the manufacture of wrenches.

The Portage Rubber Company, Akron, Ohio, has decided to build a new plant at Barberton, Ohio, adjoining its present reclaiming plant. The plant will be used largely for the manufacture of molded and mechanical rubber goods.

The Canton Boiler & Engineering Company, Canton, Ohio, has increased its capital stock from \$100,000 to \$125,000.

The Phelps Can Company, Baltimore, Md., will build a large can factory at Weirton, W. Va., near Steubenville, Ohio. Five buildings will be erected, the contract for one of which has been placed. This will be 150 x 160 ft.

The Galion Iron Works Company, Galion, Ohio, will enlarge its plant by the erection of a building, 50 x 100 ft., for storage purposes, and will probably shortly build an extension, 150-ft. long, to its brick factory building.

Plans for a new plant to be built by the Peck, Stow & Wilcox Company, Cleveland, at Southington, Conn., are being prepared by Anton Burchard, engineer, Cuyahoga Building, Cleveland. The new buildings will include a machine shop and warehouse combined 50 x 300 ft., five stories, of mill construction; a forge shop, 60 x 300 ft., one story, of steel and concrete construction; a foundry irregular in shape, containing 14,000-sq. ft. of floor space, of brick and steel construction; wood mill, 40 x 140 ft., two stories, mill construction; miscellaneous building, 112 x 40 ft., one story, brick and steel construction, and a power plant. An engine and generator to provide 750-hp. will be purchased. It is stated that little if any new machinery will be required for the machine shop, as the company's old plant is well equipped with machine tools. Contracts for the new buildings will be placed shortly.

St. Louis

ST. LOUIS, Mo., March 13, 1911.

Business the past week has been rather slow, although a fair run of miscellaneous orders has been entered by the various dealers.

The McKinney Traction Cultivator Company, with \$2,000,000 capital stock, has opened an office in St. Louis and will build a factory in East St. Louis as soon as a site is determined upon.

The Emerson-Bishop Refrigerator Machinery Company has incorporated with a capital stock of \$400,000, and will later on erect a factory for making its equipment, which for the present will be contracted out.

The Scullin-Gallagher Iron & Steel Company has some improvements under way.

Manufacturers of brewers' machinery seem quite busy, some of these being booked ahead for several months for their maximum output.

The street car manufacturing companies are well occupied with work, and business with the structural shops is improving.

The United Drug Company's representatives have been visiting St. Louis for the purpose of inspecting sites for a mammoth drug manufacturing plant, which will employ upward of 1,000 persons. The location will lie between the cities of St. Louis and Kansas City. The parties who are

charged with the decision are L. K. Liggett and Louis I. Schriener of Boston. The company has a capital stock of \$5,000,000, and has a home plant at Boston, Mass.

The Spring Pipe Threader Company, St. Louis, has been incorporated with a capital stock of \$50,000. The incorporators are Chas. Maxwell, Roy M. Ellers and J. W. Calhoun. The company will engage in the manufacture of machinery, &c.

The Automatic Mailing Machine Company, Kansas City, Mo., has been incorporated with a capital stock of \$100,000. The incorporators are W. C. Renfro, F. R. S. Ditmars and L. A. Robertson.

The Hannibal Bag Company, Hannibal, Mo., has been incorporated with a capital stock of \$30,000. The incorporators are C. R. Hamilton, Geo. T. Hamilton and Dora E. Hamilton.

The Board of Public Works, St. Louis, Mo., will install a new electric plant in the basement of the city hall at a cost of \$70,000.

The Hempstead Structural Steel Company, St. Louis, Mo., is erecting a bridge shop, 75 x 114 ft., with sawtooth skylights covering the entire roof. The equipment for the present will consist of one large and one small punch, air compressor, with all necessary appliances, drill presses, cold saw, emery wheels, &c. All machines will be direct motor driven.

The Star Bucket Pump Company, St. Louis, Mo., will erect a factory building, 75 x 125 ft., four stories, which will be equipped with sprinkler system and electric elevators.

The Missouri Lamp & Mfg. Company, St. Louis, Mo., is adding an additional story to its factory building, and will install an electric elevator.

Cole Camp, Mo., is planning the construction of a \$10,000 waterworks system.

The Harrisburg Electric Light & Power Company, Harrisburg, Ark., has been purchased by Morris Hayutin of that city, who will make extensive improvements.

A company to be known as the Farmers' Elevator Company is being organized at Bradish, Neb. The president is David Fitch. The erection of an elevator will be begun at once.

A syndicate has been organized by the firm of C. E. Foote & Co., Topeka, Kan., with \$100,000 capital stock to develop the Hoffman copper mine in Mohave county, Arizona. C. J. Price of Topeka has been engaged as consulting engineer, and work will begin immediately on the construction of a mill which will be equipped with crushers, rolls, tables, boilers, engines, and power plant. Purchases will be made by the engineer who now has the matter under consideration.

Woodward, Okla., has under consideration the question of issuing \$30,000 in bonds for a municipal lighting plant.

The Hospital & Health Board, Kansas City, Mo., has under consideration the installation of an ice plant at the General Hospital.

The Zonri Mfg. Company, St. Louis, has been incorporated. The capital stock is \$35,000. The incorporators are Daniel J. Murnane, James B. Bettis and C. C. Collins. The company will engage in the manufacture of building materials and fixtures of all kinds.

The American Fillers Company, St. Louis, has been incorporated. The capital stock is \$200,000. The incorporators are J. W. Willan, Lewis Lipton, Jr., and Homer Carroll. The company will do general mining, milling and manufacturing.

Detroit

DETROIT, MICH., March 13, 1911.

Manufacturers in general are well satisfied with the past week. The volume of orders, characteristic of the first week of March, continues unabated. For some reason orders held off the first of the year, but many pending deals justified predictions of a banner year. Now, however, predictions are being fulfilled by the great influx of orders, and all manufacturers are elated over the excellent outlook. The Alden-Sampson Company recently removed from Pittsfield, Mass., made a record shipment of motor trucks this week, a consignment of over \$80,000 worth leaving Thursday. The Hupp-Yeats Electric Car Company has exhausted its capacity, and all orders for cars are now required to be made in advance. The accessories trade is recovering from the slump of the first of the year, and is running to the normal output.

In all probability the Henry & Wright Mfg. Company, at present located at Hartford, Conn., will remove its drill press plant to Detroit. For several days the principals of the company have been in conference with the Board of Commerce, with the view of obtaining a suitable factory

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site. They desire about 40 acres, and plan to group together several manufacturing establishments, turning out mechanical equipment employed in connection with drill presses.

The Hupp Motor Car Company has selected Windsor, Ont., as its Canadian factory branch. The factory will be a two-story structure, and will be fitted complete throughout.

The Auto Accessories Company, makers of motor car equipments, has filed notice of dissolution. The action has been contemplated for some time past.

With a capital stock of \$10,000 the Detroit Insulator Company has filed articles of incorporation with the state secretary. The company will engage in the manufacture of wire insulation. Harry A. Robertson is the principal stockholder.

The Detroit-Chatham Mfg. Company, has incorporated with a capital stock of \$100,000. The company is organized to take over the plant of the Barnes Motor Car Company. Plants will be operated, both in this city and Chatham, Ont. The equipment will not be enlarged at present, but the plants will be increased in capacity as soon as conditions warrant it. The company starts with plenty of paid in capital, and is in good standing. Louis Lemberg is a large stockholder.

The Gilmore Cragg Motor Mfg. Company is the name of a new company organized to manufacture gas engine motors. The organization is in the hands of George Gilmore.

Holland, Mich., will vote at the April election on the question of bonding the city for \$15,000 for water works improvements.

Hastings, Mich., is planning to erect a water works and electric lighting plant. The proposed bond issue of \$120,000 has been given every assurance of being passed at the spring election.

H. I. Norton of Marinette, and H. S. Duquaine of Crivitz, Mich., are organizing a company with a capital stock of \$100,000, to erect a large fibre plant on the Pike River. The company proposes to make use of the water power available.

The Kenmore Mfg. Company, Chicago, Ill., is planning to remove its present plant to Battle Creek, Mich. Representatives of the company are in the latter city conferring with the Industrial Association.

The Detroit Edison Company made considerable improvements during the past year. The wonderful growth during the past year will mean still more equipment. The capacity of the Delray plants will be increased to 62,000 kw. by the addition of a new 14,000 kw. turbine generator, if present plans carry.

The Curtis & Reichhelm Company incorporated the past week with a capital stock of \$400,000. The company's product will be a patent press feeder, tests of which are to be made by two large concerns, who will install the feeders. Details of the organization are in the hands of Frederick L. Curtis.

The Brillion Mfg. Company, Menominee, has been formed to succeed the Brillion Woodenware Company. The factory will be opened at once for the manufacture of cheese boxes.

The Duryea Automobile Works, Reading, Pa., will move its large plant to Port Huron, Mich. The Chamber of Commerce of the latter city has been working for its location for some time past, and feels highly elated over its success.

The Traverse City Canning Company, Traverse City, Mich., has been sold to R. J. McDonald of the same city. Mr. McDonald plans to put the concern on a firm financial basis, and will overhaul and enlarge the equipment of the plant.

The Otsego Chair Company, Otsego, Mich., is making plans for the erection of a branch chair factory at Cadillac.

William E. Polhemus, of the Battle Creek Roofing Company, Battle Creek, Mich., has plans completed for the organization of a paint and varnish plant, to be located at the latter city. Construction on the building has been started already.

The Universal Implement Company, Orion, Mich., has increased its capital stock from \$15,000 to \$25,000.

The American Electrical Heater Company, of this city, has plans under way for the building of an addition to its plant that will increase its capacity by about one-half. The building will be reinforced concrete 120 x 130 ft. and two stories.

E. A. Clements and Cornelius A. Harvey, the former president of the Grand Rapids Board of Trade, have organized a pearl button plant, to be located at Grand Rapids, Mich., with a capital stock of \$150,000.

The plant of the Quaker Oats Company, Battle Creek, Mich., was burned to the ground March 7. The plant is a total loss, and will require entire reconstruction. The loss will reach \$100,000.

Included in the list of improvements, to be undertaken by the Pere Marquette system, is an item of nearly \$400,000,

to be spent in Grand Rapids, Mich. The most important improvement will be the erection of a 40-stall round house. This, with an addition to be built to the present machine shops, will double the capacity of this department, and cost in the neighborhood of \$135,000.

An electric line from Benton Harbor to Dowagiac, Mich., is being actively promoted. Manager Mason, of the Benton Harbor line, proposes to the City Council to float an issue of \$200,000 second mortgage bonds to finance the line.

Menominee, Mich., is planning to erect a main middle bridge over the Menominee River. The plans are in the hands of City Engineer Haas, who makes his report this week to the council.

The T. C. Beach Company, St. Johns, Mich., has incorporated with a capital stock of \$10,000. The firm will manufacture sectional furniture to be sold direct to customers.

The new factory of the Empire Cement Company, Menominee, Mich., will cost in the neighborhood of \$200,000. Work on the plant will commence this summer. According to a contract with the city the company must have spent \$50,000 before the first of next year, to acquire the factory site, which is valued at \$12,000.

The Ayers Engine & Motor Company, Trenton, Mich., has increased its capital stock from \$100,000 to \$160,000. The increase will allow the company to enlarge the plant's capacity.

The Williams Gas Machine Company, with a capital stock of \$25,000, filed articles of incorporation with the secretary of state this week. The new firm will locate at Grand Rapids, Mich.

A new motor boat company, to be known as the Hacker-Pouliot Boat Company, has filed articles of incorporation with a capital of \$10,000. The company's plant will be located in this city.

Bread making machinery will be the product of the American Bread Machinery Company, a concern organized at Lansing, Mich., last week. The company will start with a capital stock of \$5,000.

The Little Tour Transmission & Motor Company has organized with a capital stock of \$15,000. The plant will locate in this city, and will make a light running engine.

The Upjohn Company, Kalamazoo, Mich., maker of medicines and pills, suffered a \$100,000 fire loss last week. The company will rebuild immediately.

W. J. Mead, general manager of the Olds Motor Works, Lansing, Mich., states that surveyors will be put to work immediately to survey land adjoining the present structures, with the intention of erecting a large factory building to increase the plant capacity by 50 per cent. The building will be a three-story and basement structure, 74 x 758 ft.

The Newaygo Engineering Company, Newaygo, Mich., which was in course of construction a new two-story factory, will be in the market for a 15-in. lathe and one or two drill presses about April 15.

The Pittmans & Dean Company, Detroit, Mich., is having plans prepared by John Scott & Co., architects of that city for the installation of an artificial ice plant.

The Automatic Faucet & Spigot Company, Saginaw, Mich., will erect a new building, 40 x 80 ft., in place of the one recently destroyed by fire.

The Industrial Works, Bay City, Mich., manufacturer of locomotive cranes, contemplates building an addition to its machine shop some time this spring.

Indianapolis

INDIANAPOLIS, IND., March 14, 1911.

The Auto Keyless Lock Company, Indianapolis, Ind., has been incorporated with \$50,000 capital stock to manufacture locks. The directors are: Andrew J. Coppock, Charles Mabey and S. A. Clinehens.

The Hydraulic Drive Company has been organized at Indianapolis, with \$50,000 capital stock, to manufacture transmission devices. The directors are F. H. Cheyne, Charles S. Walker and Thomas H. Endicott.

The Roth-Murphy Engine Starter Company, Indianapolis, Ind., has been incorporated with \$50,000 capital stock, to manufacture an engine starter. The directors are G. W. Roth, W. H. Murphy and David R. Murray.

The Compeer Cigar Company, Indianapolis, Ind., is preparing plans for the erection of a six-story building, to be used for manufacturing cigars. The building will be of reinforced concrete, equipped with elevators and other modern conveniences. L. M. Crump is president of the company.

The Westerfield Gas Engine Company, Indianapolis, Ind., has increased its capital stock from \$50,000 to \$75,000.

The Warren Electric & Machine Company, Indianapolis, Ind., has been incorporated with \$10,000 capital stock, to manufacture electrical machinery. The directors are E. F. Warren, L. W. MacNought and E. C. Strathmann.

The Upland Electric Company, Marion, Ind., has been

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incorporated to manufacture electricity. The directors are George M. Tidd, H. L. Finley and Frank D. Ball.

The McDonald Bros. Pitless Scale Company, Newcastle, Ind., has been incorporated with \$10,000 capital stock, to manufacture scales. The directors are R. E. McDonald, B. T. McDonald, Jr., and Paul Brown.

T. C. Bugg of Oakland City, Ind., has leased coal lands near there, and is going to open a mine. The equipment will be for a capacity of 100 tons a day.

The Decatur Motor Car Company, Decatur, Ind., has increased its capital stock from \$150,000 to \$200,000. The president is M. E. Brackett.

The Keystone Mfg. Company has been organized at Muncie, Ind., by L. S. Ganter, E. G. Burke and J. D. Allen, to manufacture table ware.

The Evansville Marine Motor & Foundry Company, Evansville, Ind., has been incorporated with \$20,000 capital stock, to do a machinery manufacturing business. The directors are Benjamin F. Drury, Charles F. Donnelly and Charles L. Bloner.

Henry Nyberg of Chicago has purchased at receiver's sale the Rider-Lewis Motor Car Company's plant at Anderson, Ind., for \$40,000.

The St. Paul Stone Quarries Company, St. Paul, Ind., is endeavoring to interest additional stockholders for the purpose of enlarging the present stone crushing plant.

Rertsch & Co., machinists, Cambridge City, Ind., last week shipped to the American Car & Foundry Company, at Jeffersonville, a 10-ft. metal shear, weighing 30,000 lbs.

The City Carriage Works, Ft. Wayne, Ind., has been incorporated with \$20,000 capital stock, to manufacture vehicles. The directors are John B. Rolape, Chas. J. Homary and T. C. Harges.

The Arnold-Wagner Company has been incorporated at South Bend, Ind., with \$10,000 capital stock, to manufacture electrical supplies. The directors are Earl H. Arnold, John W. Arnold and Joseph W. Wagner.

Donald MacGregor has been appointed receiver for the Pioneer Metal Mfg. Company, South Bend, Ind., on the petition of John V. Meyer, wholesale hardware dealer, who alleged that the capital stock was abnormally larger than the assets. The liabilities are placed at \$44,000, the assets at \$4,500. The capital stock is \$50,000.

The Fort Wayne Motor Sales Company, Fort Wayne, Ind., has been organized to manufacture and deal in automobiles and automobile parts. The capital stock is \$10,000. The directors are Charles R. Dancer, H. R. Fullenwider and H. S. Morrison.

The Caldwell & Drake Construction Company, Columbus, Ind., has been awarded the contract for the erection of a 12-story hotel in Louisville; contract price being between \$700,000 and \$800,000.

The New Idea Specialty Mfg. Company, Fort Wayne, Ind., recently incorporated to take over the business of the Pen Ejector Pen Holder Company, is planning the erection of a new factory. The company will be in the market for some automatic wood working machinery and equipment for making steel springs for the manufacture of the pens, pen holders, &c. L. J. Libbing is president of the company.

Bolner & Peck, Eaton, Ind., are making inquiries for some second-hand machinery, including one lathe, 24 or 30 in. swing, and one gasoline engine, 16 to 20 hp.

The Westerfield Gas Engine Company, Indianapolis, Ind., has been incorporated with \$50,000 capital stock by G. G. Westerfield, J. E. Westerfield and A. H. Nordyke.

The Winona Electric Light & Water Company, Warsaw, Ind., will make improvements to its plant, including the installation of new pumps.

Plans and specifications for the new plant of the North-western Can Company to be erected at Brazil, Ind., are on file at the office of the Commercial Club of that city. The building to be erected will contain approximately 60,000 sq. ft. of floor space. A power plant will also be installed by the company.

The I-X-L Furniture Company, Goshen, Ind., is erecting a two-story and basement brick machine room, 50 x 100 ft., which it will fully equip with wood working machinery. A two-story brick warehouse and packing room, 55 x 125 ft., is also being erected by the company.

The Elkhart Paper Company, Elkhart, Ind., is having plans prepared for a new building, 40 x 200 ft., one-story and basement, and an addition, 55 x 136 ft., one-story and basement. The large building will be equipped with a paper making machine, and the other will be used for a finishing room.

The Miller-Kemper Company, Richmond, Ind., recently incorporated, has acquired a site of seven acres, on which it is erecting two buildings, one 50 x 100 ft. and the other 30 x 200 ft. The company will do a general contracting and building business, and has purchased all necessary equipment, with the exception of 40 hp. motors and dry kiln, with independent boiler for heating.

Toronto

TORONTO, ONT., March 11, 1911.

There is every indication that vessels will be able to come up the St. Lawrence earlier this year than usual. The weather is uncommonly mild for March, and unless there is a return of winter temperature, the ice should not long remain a hindrance to navigation. That prospect is favorable for trade, and especially for trade with the United Kingdom and other European countries. Assurance that delivery will not be delayed is a consideration with persons who have orders to place that can be filled by British and German houses. It is understood that a larger volume of merchandise than usually comes in on the first boats, will arrive from the other side of the Atlantic at the beginning of this season. Machinery and equipment are lines in which competition is growing keener. There are few branches of merchandise in which so many outside countries are so nearly on an equal footing to supply the goods. In textile lines, in paper goods, some one country has usually a great advantage over others, such as the United States has in the matter of cotton.

Canadian buyers of machinery and equipment are turning the competition to account. They still present a good demand, and they find that makers of plant are not so busy as to be above offering inducements to those who have good orders to place.

The Commissioners of Queen Victoria Niagara Falls Park are calling for tenders for the construction of steel concrete bridges for the boulevard they are making. Information can be obtained from the superintendent, John H. Jackson, Niagara Falls, Ont.

A large quantity of machinery is being hauled to the Porcupine gold field from the railway line. Special efforts are being made to get engines, compressors, drills, stamps, &c., forward before the winter road breaks up. The railway branch will be completed as soon as possible, but it is deemed important to get plant in position with the least loss of time.

United Motors, Ltd. will erect a factory in Welland, Ont., this summer. The plant of Electro-Metals, Ltd. in that town is to be doubled.

Low water at the Chaudiere is making difficulties for the manufacturers in Ottawa and Hull, who depend upon power from that source.

The Bishop Silver Mines, Ltd., proposes to put in a compressor plant at its West Ridge properties, Gowganda, Ont.

The Canadian Pacific Railway Company will spend from \$1,000,000 to \$1,500,000 this year on the mountain section between Revelstoke and Field.

The Medicine Hat Milling Company, Medicine Hat, Alberta, will treble the capacity of its plant.

The Canadian Pacific Railway Company has called for tenders for the construction of a round-house in London, Ont., to accommodate 22 locomotives. Machine and boiler shops are to be built in connection with the round-house.

It is reported from St. Thomas, Ont., that the Monarch Knitting Company has cancelled its order for machinery to equip the branch factory it was to erect in that city, and that nothing will be done in pursuance of the building plans until the reciprocity agreement is disposed of.

Advices received in Toronto and Montreal by banks and loan companies doing business in the Canadian West, are to the effect that more money will be required this season in that part of the country than ever before, and that building operations there are likely to run to larger figures than in any former year.

Toronto's Board of Control has decided to ask for tenders for plant to be used in the construction of new street railway lines. It is estimated that the outfit will cost \$95,374. Tenders are also asked for the providing of the rails required.

The Minister of Railways and Canals has announced that the construction of the Hudson Bay Railway will be begun by the Dominion Government without delay.

The Premier of Quebec announces that his government will not alter its purpose to maintain an embargo on the exportation of pulpwood cut on the Crown lands of the Province. Everything should be done, he says, to foster the domestic paper industry. A similar announcement of policy was made sometime ago by the Premier of Ontario. In both Provinces large pulp and paper projects are being entered upon, and there are expectations of great development in that line for some time to come.

The management of the Montreal Light, Heat & Power Company announces that the directors have decided upon

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an expenditure of \$1,000,000 for the enlargement and improvement of the plant this year.

The Prairie Fuel Gas Company has just been organized with a capital stock of \$8,000,000 to take over the interests of the Calgary Electric Light & Gas Company, in Calgary, Alberta.

The Winnipeg Electric Street Railway Company is preparing to erect a new power house at the foot of Portage avenue, East. About 16,000 hp. will be generated there.

The Southern Alberta Land Company is building a very extensive irrigation system south of the Canadian Pacific Railway main line. Hundreds of miles of irrigation ditch, together with weirs, aqueducts, and pipe lines, and a stretch of railway, are being made. Water is being taken from the Bow River in the vicinity of Namaka.

The Pacific Coast Coal Mines, Ltd., Victoria, proposes to double the output of its South Wellington properties. Improvements calling for the expenditure of \$500,000 are planned.

A syndicate of Winnipeg men has acquired the assets of the Fort George Lumber & Navigation Company. Extensive improvements are planned. J. D. McArthur, railway contractor, Winnipeg, Man., is at the head of the syndicate.

Application has been made to the Dominion Government for a charter for the Alberta Electric Railway Company, with a capital stock of \$10,000,000.

The Bell Telephone Company of Canada is about to provide for further improvements by a new bond issue of \$1,250,000.

The Board of Trade, at Dawson, Yukon District, has adopted a resolution in favor of the placing of mining machinery unqualifiedly upon the free list.

It is stated that the British Columbia Steel Corporation, to which charter has just been issued by the Dominion Government, with a capital stock of \$10,000,000, has received a communication from American interests to establish large car and foundry works in connection with its plant at or near Port Mann.

The Regina Tractor Company, Regina, Saskatchewan, has reorganized, and is taking over the Regent Gasoline Tractor Company. The new company's capital stock is \$250,000.

The Moncton Tramway Electricity & Gas Company, Moncton, N. B., has submitted to the city final plans showing the routes of proposed lines and for a complete natural gas installation. Thirty miles of gas mains are to be put down.

The Electrical Maintenance & Repair Company, Ltd., Toronto, Ont., recently incorporated with \$40,000 capital stock, has taken over an existing plant, but will erect a new factory in the near future, 20 x 80 ft., to be equipped with traveling crane, hot water heating system, &c.

Adam Hall, Ltd., Peterborough, Ont., manufacturer of steel ranges and heaters, recently incorporated with \$100,000 capital stock, has just completed the erection of a foundry building, 46 x 114 ft., fully equipped with traveling crane, drills, emery wheels, rattlers, hoist and all other necessary tools.

The Dowsley Spring & Axle Company, Ltd., Chatham, Ontario, Canada, is erecting an addition to its plant, 46 x 135 ft., of brick and frame, and is installing a new engine of 100 hp. and other new machinery. It manufactures car springs, carriage springs, seat springs, axles, gears, &c.

The South

LOUISVILLE, KY., March 14, 1911.

There has been a slackening up of business, according to reports received from some machinery manufacturers, although the number of inquiries for general equipment apparently indicates that there is a lot of prospective business in the market. Complaint is also being heard that some manufacturers are quoting prices which are far below normal and below the level which others have fixed as their minimum. Quarrying and crushing machinery continues to be in good demand.

The Kentucky Electric Company, Louisville, which is to build a new and larger plant, has begun to buy its equipment. The machinery purchased thus far includes one 2000-kw. turbo-generator, from the General Electric Company; one 4000-kw. turbo-generator from the General Electric Company and one 100-kw. turbo-exciter and one 100-kw. motor-generator exciter from the same company. In addition the company has purchased from the Babcock & Wilcox Company four 1000-hp. boilers, four superheaters

and four stokers. It has still to buy its condensers and several other important items. Work on the construction of its new buildings, for which additional ground has been bought, will begin before April 1.

R. B. Tyler & Co., Louisville, who have bought the Tucker quarries at Tucker, Ky., will purchase a complete crushing outfit, including boilers, compressors and drills, and will extend the operations at Tucker. Several local concerns are figuring on the contract.

E. D. Morton & Co., dealers in machine tools, conveying machinery and mill supplies, have removed from the Board of Trade Building to 516 West Main street, Louisville, where they will carry a large amount of machinery in stock.

The Urwick Machinery & Supply Company has changed its name to the Brandeis Machinery & Supply Company, Robert E. Brandeis purchasing the interest of C. Urwick in the company. Among the interests which it represents are the Nye Steam Pump & Engine Company, the Ingersoll-Rand Company, the Lidgerwood Mfg. Company, the Hayward Company, John H. McCowan Company and others.

The Moran Flexible Steam Joint Company, Louisville, has decreased its capital stock from \$250,000 to \$25,000. Thomas W. Moran is president of the company.

A company has been formed at Jeffersonton, Ky., for the establishment of an electric light plant, a franchise for which has been created by the town council. The new plant is to cost \$15,000.

County Judge Gilbert, County Attorney Pickett and members of the Fiscal Court at Shelbyville, Ky., have been authorized to purchase road machinery, including two steam rollers, graders, harrows, &c.

The Kentucky-Tennessee Traction Company, of which Charles Vanden Burgh, of Hopkinsville, Ky., is general manager, will erect a power-house for the operation of several interurban lines in western Kentucky. The Arnold Company, Chicago, is engineer.

The Maysville Public Service Corporation, Maysville, Ky., has been formed with \$150,000 capital stock to take over the gas, electric light and street railway properties. The electric light plant will be considerably enlarged.

The Uniontown Brick & Tile Company, Uniontown, Ky., is planning improvements, including the installation of machinery for the manufacture of tile shingles.

The Maysville Milling Company, Maysville, Ky., of which J. F. Gebhart is president, is receiving bids on the equipment of a \$20,000 meal and flour mill.

The Lewisport Electric Light Plant, of which J. C. Emmick is manager, and which recently received an electric light franchise at LaGrange, Ky., is to open bids April 1 for the installation of a 65-hp. gas engine, a 45-kw. direct current 250-volt generator, and other equipment needed for the LaGrange plant.

N. L. Gilbert, manager of the Kentucky Tobacco Works, of Murray, Ky., is asking for prices on a 60-hp. boiler.

The Board of Public Works, of Bowling Green, Ky., is preparing to advertise for bids for a new engine to be installed in the electric light plant and a new pump for the water works plant will be bought. The present engine has been in use 23 years. The machinery, it is expected, will cost \$8000.

Thomas L. Fitch, of Louisville, has purchased an interest in the Richmond (Ky.) Electric & Power Company. The company recently increased its capital stock, and it is understood that some improvements will be made.

Construction of the hydroelectric plant of the Eastern Tennessee Power Company on the Ocee River, near Chattanooga, is progressing rapidly; it is reported, and may be completed by January 1, 1912. Six 200-hp. boilers have been installed.

M. L. Jack, of Philadelphia, is promoting the organization of a company at Morristown, Tenn., for the manufacture of furniture. It is expected that the proposed plant will cost \$15,000.

A bond issue of \$60,000 has been authorized at Clarksville, Tenn., for the purpose of improving the waterworks. A new pumping station will be installed.

The Severance Mfg. Company, Nashville, Tenn., recently incorporated, is to purchase machinery for the manufacture of gas mantles.

The J. C. Tassey Automatic Motor & Flue Press Company has been incorporated at Nashville, Tenn., with \$10,000 capital stock by Lorenz Neuhoft, L. C. Holt and others. Automatic flue machines and boiler flue presses will be made.

Maryville, Tenn., has petitioned the Legislature for authority to issue \$100,000 of bonds for the construction of a water system.

It is reported that the Steinhauer Truck & Motor Car Company, of St. Louis, of which R. Shaul is president, is

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contemplating the establishment of a factory at Memphis, Tenn.

Memphis, Tenn., is considering the erection of a municipal electric light plant, and officials of the city will make a tour of inspection for the purpose of investigating plants in other cities.

The Nashville Gas Company, Nashville, Tenn., has increased its capital stock from \$1,150,000 to \$1,500,000. It has not been announced whether the increase is for the purpose of making improvements in the plant.

The Nashville, Chattanooga & St. Louis Railroad has purchased ground in Memphis, Tenn., and will erect shops and roundhouses there. The cost of the improvements is to be \$125,000.

Stokeley Bros. & Co., Newport, Tenn., have purchased the building and power equipment of the Bellevue Cotton Mill Company and will convert the plant into a cannery, purchasing a large amount of additional equipment.

A new plant is to be constructed by the Newport, Tenn., Tanning Company.

David G. Baker, Philadelphia, is reported to be working on plans for a new blast furnace at Chattanooga, Tenn., to be built by the Citico Furnace Company. Improved hot-blast stoves and an electrical power plant will be built if the proposed plans are carried out.

The St. Louis & San Francisco Railroad, which is to make improvements at Bellevue, near Memphis, Tenn., will build a six-stall roundhouse at a cost of \$150,000.

Gadsden, Ala., is considering the issue of \$40,000 of bonds for the completion of the waterworks system.

The Edmondson Electric Plant & Mfg. Company, Edmondson, Ark., has been incorporated with \$50,000 capital stock. It will operate a lighting plant and manufacture lumber.

Morris Hayutin, Harrisburg, Ark., has purchased the controlling interest in the Harrisburg Electric Light & Power Company, and will make extensive improvements.

Equipment is being purchased by Sam J. Beck, of the Jennings Oil Company, Pittsburg, in connection with operations at Bison, Ark.

The Laurel Light, Heat & Power Company, Laurel, Miss., has been incorporated with \$30,000 capital stock by J. T. Pullen, R. T. Young and others.

Improvements in the gas plant at Huntsville, Ala., which was recently taken over by new interests, will be made a new corporation, known as the Huntsville Gas, Light & Fuel Company, having been organized to operate the property. M. Rea Gano, of Philadelphia, is president, and Ed. P. Vogels secretary of the new company.

A Philadelphia syndicate has purchased the control of the Helena Gas & Electric Light Company, Helena, Ark., and will make improvements which will involve the expenditure of \$350,000. A new powerhouse will be built at once. Newberger, Henderson & Loeb are the Helena representatives of the syndicate.

Byhalia, Miss., will issue \$10,000 of bonds for the construction of an electric light plant.

The Darrough Warehouse Company will erect a \$30,000 elevator at Little Rock, Ark. Bids for its equipment will be called for at once.

The Alexandria Street Railways Company, Alexandria, La., has been taken over by J. A. White and others, and will be reorganized. Improvements will be made in the property by its new owners.

The City Council of Clarkville, Tenn., has decided to issue \$60,000 in bonds to install water meters and erect a new pumping station.

The Gulf Iron Works, Tampa, Fla., has in course of construction an iron and brass foundry and machine shop. The building is of corrugated iron and steel, 50 x 100 ft., two stories, and will be equipped with a 5-ton traveling crane and machinery for the manufacture of phosphate mining machinery and general repairing.

The Southern Airship Company, Columbia, S. C., has been incorporated with \$500,000 capital stock, and will erect a plant to manufacture an aeroplane designed by Victor Jossenberger, of Toronto. The company is now making tests with its machine, and is in the market for gasoline engines from 30 hp. upward, radiators, &c.

The Owens West Virginia Bottle Machine Company, Fairmont, W. Va., has plans for improvements to its plant to almost double its present capacity. The company will spend about \$250,000 for extensions and equipment, details for which are being prepared.

The Carver Buggy Company, Morristown, Tenn., which has been doing a business under a partnership agreement, has been incorporated with a Tennessee charter for \$50,000. The company will manufacture buggies, surreys, traps and kindred lines for the Southern trade. O. K. Carver, is president of the new company.

The City Council of Newton, Miss., is considering the installation of an electric light plant at a cost of \$11,000.

Texas

AUSTIN, TEXAS, March 10, 1911.

Settled weather and satisfactory business conditions are the reports that come from all parts of Texas. In Arizona and New Mexico increase in mine development is reported, and this has augmented the demand for machinery for the different lines of that industry. The revolutionary situation in Mexico, while it is annoying to the Government, and is paralyzing business interests in some of the Northern States of that country, is not generally regarded as being of sufficient importance to menace the administration of President Diaz. The most serious result of the operations of the bands of rebels is the tying up of lines of transportation, thus preventing machinery, supplies and other commodities from reaching the mining camps and different towns and industrial centers.

The Corpus Christi Street & Interurban Railway Company, Corpus Christi, Texas, has been granted a franchise by the City Council to extend its lines to suburban parts of the town.

The system of interurban railway that is being constructed in the lower Rio Grande valley by S. A. Robertson, of San Benito, Texas, and associates, will be extended from San Benito to Mission, about 75 miles. The route of the proposed extension is through a number of irrigated plantations.

C. C. Frampton and H. A. Clapp are arranging to erect a large brick manufacturing plant at Corpus Christi.

The Kettler Brass Mfg. Company, Houston, Texas, has increased its capital stock from \$30,000 to \$60,000. It will make improvements.

The Boards of County Commissioners of Nueces and San Patricio counties contemplate joining in the construction of a new steel bridge across the Nueces River. Corpus Christi is the county seat of Nueces County.

The Board of Trade of Cleburne, Texas, is promoting the organizing of a local company to erect and operate a factory for the manufacture of automobiles at that place.

The large sawmill of Saner & Whiteman, at Caro, Texas, which was destroyed by fire a few days ago, entailing a loss of about \$100,000, will be rebuilt.

The reorganization of the Corsicana Cotton Mills has been effected, and the plant will be overhauled and placed in operation. It is situated at Corsicana, Texas.

E. C. Robinson, of St. Louis, Mo., who has been investigating the situation at Crystal City, Texas, with the view of installing an electric light and power plant there, is reported to have decided favorably upon the proposition.

The Brownsville Irrigation Company, which recently passed into new hands, will greatly enlarge the capacity of its pumping plant. The present capacity of the plant is sufficient to water about 15,000 acres, and it will be enlarged to water about 40,000 acres. The company's system of irrigation is situated near Brownsville, Texas.

The cotton gin of the Industrial Cotton Company at Denison, Texas, will be equipped with new machinery.

A new cotton ginning plant will be installed at Lavernia, Texas, by Kott & Wiseman, of that place.

J. C. Saunders, of Bonham, Texas, and associates, will take immediate steps toward enlarging the cotton mill at Cuero, Texas. The reorganized company that has taken over this plant, has a capital stock of \$125,000.

The Goliad Supply Company has been organized for the purpose of installing a water works system, an ice factory and electric light plant at Goliad, Texas.

The City Council of Timpson, Texas, will order an election to vote on the proposition of issuing \$20,000 of bonds for constructing a water works system.

Wallace & St. John, Detroit, Mich., have taken preliminary steps toward applying to the City Council of Temple, Texas, for a franchise for a gas plant and distributing system for that place. The estimated cost of the proposed works is \$100,000.

T. B. Love is installing a water distributing system in the North Sierra Blanca subdivision of Sierra Blanca, Texas.

The Wagner Mfg. Company, Cedar Falls, Iowa, contemplates establishing a branch factory at Houston, Texas, for the manufacture of hardware specialties.

The sawmill of William Cameron & Co., at Saron, Texas, which was recently destroyed by fire, causing a loss of about \$100,000, will be rebuilt as soon as the plans can be prepared and the contracts let.

L. T. Hands, Sandusky, Ohio, has been investigating the situation at Roswell, N. M., as the representative of the American Roller Mills, of Middletown, Ohio, with the view of erecting a flour mill at Roswell.

The Roswell Gas & Electric Company, Roswell, N. M.,

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is rebuilding its electric power plant and enlarging its capacity with the view of providing power for irrigation pumping plants in that part of the Pecos River valley. The Berrendo Farms Company will install 65 pumping plants, each of a capacity of 1000 gal. per minute, all to be operated by electricity. The Roswell Gas & Electric Company will construct a system of transmission lines to cover the valley territory.

The Guanajuato Foundry & Sheet Iron Works of Guanajuato, Mexico, owned by Andrew Ennis, is being enlarged and otherwise improved.

The City of Lufkin, Texas, will open bids March 24 for two 100-hp. return tubular boilers, two boiler feed pumps, one 200-hp. open type feed water heater, two compound duplex pumps, one condenser and wet vacuum pump, two 75-hp. motors. Specifications can be had from the city clerk, or by addressing the O'Neil Engineering Company, Dallas, Texas.

Pacific Coast

PORTLAND, ORE., March 8, 1911.

The machine tool trade continues moderately active, the principal demand being for tools of comparatively small size for shops doing work of a miscellaneous character. Conditions in the lumber market are hardly up to expectations, but many logging camps are opening for the spring season, and there is considerable demand for donkey engines and general equipment, as well as for sawmill and woodworking machinery. Local building continues extremely active, and numerous contracts are being let for elevator equipment, &c. A large amount of municipal work is offered in both Oregon and Washington, giving rise to some inquiry for general contractors' equipment, as well as power and water works machinery. Traveling men report unusual activity in heavy power machinery, both steam and hydroelectric, throughout Oregon and in parts of California, though aside from the Tacoma development the Washington market appears rather quiet.

Hans Pederson, Seattle, Wash., has taken the general contract for completing the Nisqually power plant for the city of Tacoma on a bid of \$1,074,918. The contract includes the erection of a steel bridge over the Nisqually canyon. The city of Tacoma has just taken bids on a 10-in. horizontal series centrifugal pressure pump of 2500 gal. per minute capacity at 115 lbs. pressure per square inch direct connected to a 200-hp. 2200-volt induction motor.

The demand for sawmill machinery has been increased by the destruction of several large mills by fire. A. B. Pragna, Seattle, Wash., is designing a resaw mill to replace that of the Anacortes Lumber & Box Company, Anacortes, Wash., which was burned February 9. The plant of the A. J. West Lumber Company, near Aberdeen, Wash., was burned February 27, with a loss of about \$100,000, and plans are being made for the immediate reconstruction of the mill. A fire in South Portland, February 28, destroyed the plants of the Oregon & Washington Lumber Company, the Gold Medal Shingle Company, and the Multnomah Lumber Company.

Several important Government contracts have come out recently, and there is considerable other work of this nature in prospect. C. E. Graff, Seattle, Wash., has taken the contract for oil storage equipment at the Puget Sound Navy Yard at \$26,000, and the Moran Brothers Company, Seattle, Wash., has the steel caisson contract for drydock No. 2 at the same place at \$125,000. A caisson contract for the Pearl Harbor drydock in Hawaii, T. H., has been awarded to the Union Iron Works, San Francisco, at \$133,892.

Capt. Thomas H. Jackson, United States Engineers Corps, San Francisco, has invited Portland firms to bid on the construction of two 20-in. suction dredges to be used by the Government on San Francisco Bay.

It is understood that the Crook County Water, Light & Power Company is having plans made for its power project at Cline Falls, on the Deschutes River. The plant is to supply light and power to a number of towns in the vicinity.

The Astoria Iron Works, Astoria, Ore., has taken a contract for a gasoline power boat for the DuPont Powder Company.

The Stetson-Ross Machine Works, Seattle, Wash., has established a branch office at Spokane, Wash.

The Coin Machine Mfg. Company has let contracts for its tool and laboratory building in this city.

The Corvallis Lumber Company, Corvallis, Ore., is preparing for a material increase of its equipment this spring.

Work is to be started shortly on a new round house for the Southern Pacific Railroad at Klamath Falls, Ore.

J. F. Brallier, Seattle, Wash., is working on a project to establish a woolen mill at Roseburg, Ore.

The Lister Mfg. Company is preparing to install a lot of woodworking machinery at Tacoma, Wash.

The new foundry of the Phoenix Iron Works, this city, has started operations with a run of 10 tons the first day. The company has a number of large contracts for pipe castings.

The Rogers Company, Tacoma, Wash., is preparing to install a spice mill at Spokane.

The Western Cooperage Company, Aberdeen, Wash., has ordered a small hoisting engine, and is making a number of minor improvements. The Saginaw Timber Company of the same place has ordered three large logging engines.

Demerest & Miller, Tacoma, Wash., have purchased a saw mill at South Prairie, Wash., and are installing a lot of new machinery, including a J. A. Fay & Egan resaw, and independent electric drive for all machines.

The C. L. Best Gas Traction Company, Oakland, Cal., has installed a two-ton converter, and in addition to doing its own casting work, is soliciting outside business in steel castings.

Gladling, McBean & Co., Lincoln, Cal., are building a railroad from their large pottery plant to the clay beds.

The Lincoln Clay Products Company, Sacramento, Cal., is preparing to increase the equipment of its brick plant at Lincoln, Cal.

Fred B. Wright, formerly of Chicago, has opened an office at 741 Monadnock building, San Francisco, Cal., as representative of E. P. Jamison & Co., dealers in railroad and contractors' equipment.

The Washington Portland Cement Company is tripling the capacity of its plant at Concrete, near Seattle, Wash.

J. Locke, Tacoma, Wash., is working on a large pumping plant project for irrigation purposes, to be carried out at North Yakima, Wash.

A large amount of Eastern dredging machinery is being delivered at Portland for the Spokane, Portland & Seattle Railway.

The Seattle Cornice Works, Seattle, Wash., will build a branch factory at Portland, Ore., having recently received a number of large contracts in that city.

A resolution has been passed by the City Council of Newport, Cal., providing for the construction of a municipal electric light plant, for the installation of which bonds in the sum of \$55,000 will be issued.

J. L. Hughes and associates of North Yakima, Wash., are organizing a company to establish a pumping plant of sufficient capacity for watering 25,000 acres.

The City Council of Pendleton, Ore., is planning to improve the water works system at an estimated cost of \$200,000.

Government Purchases

WASHINGTON, D. C., March 13, 1911.

The Paymaster-General, Navy Department, will open bids April 4 under schedule 3368, class 1, for one 10-ton 3-motor electric jib crane for Mare Island, Cal.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids March 28 as follows:

Class 51.—For four hydraulic variable speed gears—Bidder 36, Diehl Mfg. Company, Elizabethport, N. J., \$3408.80 and \$740, part; 146, Waterbury Tool Company, New Britain, Conn., \$2100.

Class 52.—Variable speed power transmission apparatus—Bidder 27, Cutler-Hammer Mfg. Company, Milwaukee, Wis., \$7950 and \$11,550; 36, Diehl Mfg. Company, Elizabethport, N. J., \$3408.80 and \$740, part; 49, General Electric Company, Schenectady, N. Y., \$891, part.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids March 7 as follows:

Class 21.—Bid A, one barge steam boiler and pumps, not self-propelling—Bidder 72, Maryland Steel Company, Sparrows Point, Md., \$120,000; 73, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., \$101,500.

Bid B, one self-propelling barge, steam boilers and pumps—Bidder 72, Maryland Steel Company, Sparrows Point, Md., one steamer, \$73,000, \$143,000, 28 tons.

Bid C, one barge internal combustion engine, not self-propelling, no bids.

Another Jones & Laughlin Rod Mill.—The Morgan Construction Company, Worcester, Mass., has received a contract from the Jones & Laughlin Steel Company, Pittsburgh, for a double strand Morgan continuous rod mill, which will be a duplicate of the one recently furnished by the Morgan Company to the Jones & Laughlin Company, and which is in successful operation. The mill consists of 16 trains of rolls, and is of the pure continuous type. Billets 1½ in. x 1½ in. x 30 ft. will be used. The capacity of the mill will be from 9000 to 10,000 tons per month.

Trade Publications

Extension Lathes.—Edwin Harrington, Son & Co., Inc., Seventeenth and Callowhill streets, Philadelphia, Pa. Catalogue E. Illustrations and descriptive matter explain the operation of a line of extension lathes having swings ranging from 25 to 48 in. over the top shears. The general features of the lathes are described, and this is followed by illustrations and brief specifications of the different tools, the latter being given on the pages facing the engravings.

Marine Gas Engines and Automobile Parts.—Ferro-Machine & Foundry Company, East Sixty-sixth and Hubbard streets, Cleveland, Ohio. Pamphlet. Is a souvenir of the formal opening of the new offices of the company on February 7.

Radial Drills.—Baush Machine Tool Company, Springfield, Mass. Several loose leaf circulars. These deal with the various types of drills built by this company. The make-up of the circulars is uniform, a view of the tool being given on the left inside page, while brief specifications occupy the facing one.

Mechanical Lubricator.—The Richardson-Phenix Company, Milwaukee, Wis. Bulletin No. 53. Illustrations and descriptive matter explain the operation of the Richardson model M mechanical lubricator, which was illustrated in *The Iron Age* February 2, 1911. This lubricator is designed to feed oil drop by drop from the feed nozzle at any desired rate so that the lubricant is broken up into a number of small particles which are mixed with the entering steam. It can be furnished with as many feeds as may be desired, and among the illustrations are those of a 22-feed lubricator for supplying automatic bearing lubrication to high duty elevator pumps and one having 14 feeds. The construction of the lubricator is shown by a line drawing and its operation is explained at length.

Fire Brick.—Chicago Retort & Fire Brick Company, 837 Commercial National Bank Building, Chicago, Ill. Catalogue. Deals with the various types of fire brick which this company is prepared to furnish in a variety of standard and special shapes. All of these different shapes are illustrated, and there are a number of tables giving the number of brick required to form arches of various spans and springs.

Steam Turbines.—De Laval Steam Turbine Company, Trenton, N. J. Pamphlet. Contains a reprint of an article descriptive of the company's steam turbines for both high and low pressures, which appeared in *The Iron Age* September 15, 1910.

Foundry Tram Rails.—Rockwell Furnace Company, 26 Cortlandt street, New York City. Bulletin T. Describes and illustrates the use of the Moyer tram rail in modern foundry practice. The various parts of the system and its applications are shown and the advantages of using the tram rail instead of a man for transportation purposes are pointed out.

Electrical Machinery and Appliances.—Fort Wayne Electrical Works, Fort Wayne, Ind. Two leaflets and four bulletins. Leaflets Nos. 4511 and 4512 illustrate two types of transformers, one for operating electric bells, buzzers, annunciators, burglar alarms and similar apparatus from the electric lighting circuit, and the other for transforming ordinary lighting current and rendering it available for lighting signs and houses with low voltage tungsten lamps. Bulletin No. 1120 describes an electric rock drill of the rotary design, which is operated by an electric motor mounted on the frame of the drill proper. Its mechanism consists of two parts, a revolving helve containing the hammers and the chuck mechanism for holding and rotating the drill steel. The illustrations show the various parts of the drill as well as the complete tool. No. 1122, superseding 1093, deals with the construction of the small motors made by this company, and their application to a number of different types of machines. The various motors are illustrated, together with some of the devices to which they are applied, and a partial list of the applications completes the bulletin. No. 1123, superseding No. 1066, shows a single-phase induction watt-hour meter, which is made with either a separate or a combined prepayment device. The construction of the various parts of the meter are described, and the illustrations show the operation of the interior mechanism. No. 1126, superseding No. 1114, covers the line of electric fans which this company can supply. The assortment is very complete, and the different styles and sizes are designed for all standard voltages and frequencies.

Small Milling Machines.—Chicago Machine Tool Company, 127 North Canal street, Chicago, Ill. Catalogue. Size $3\frac{3}{8} \times 6\frac{1}{2}$ in.; pages 71. This catalogue differs very much from the general run, as the net prices of the machines as well as the attachments that can be supplied are given. All the styles of millers are illustrated from the stripped machine to one completely equipped, and in each case brief specifications of the tool are given on the facing page. The construction of the machines is described at length, and there are a number of illustrations and descriptions of special work that has been done on them.

Acetylene Burners.—American Lava Company, Chattanooga, Tenn. Pamphlet. Concerned with the various types of German lava burners which this company manufactures for

use with acetylene gas. The different styles of burners are shown and the particular classes of service for which they are adapted pointed out. A page showing special tips and other gas burning parts and appliances which this company has made to order completes the pamphlet.

Power Plant Supplies.—Schutte & Koerting Company, Twelfth and Thompson streets, Philadelphia, Pa. Several catalogue sections. No. 4C refers to the use of the Koerting air-jet chimney ventilator for creating a draft. No. 7G is concerned with blast governor for Corliss engines, which control the speed by air or gas pressure furnished by a blower. No. 7L points out the advantages of using the S. & K. automatic engine lubricator, which is said to insure positive lubrication of all bearings with a complete control of the oil supply. No. 8E illustrates various types of free exhaust and back pressure valves for marine engine and steam turbine work, while No. 8V gives general description and specifications for the Schutte-Koerting vacuum breaking valve. No. 9E calls attention to the Koerting grease extractor and feed water filter for marine and stationary use. All of these sections are printed on standard 8 x 11 sheets and are punched for binding.

Gasoline Engines.—Anderson Engine Company, Shelbyville, Ill. Brochure. Relates to the Anderson marine engine, which is built in sizes ranging from $2\frac{1}{2}$ to 150 hp. The construction of all of the sizes is described, some of them are illustrated, and a complete table of dimensions is included.

Woodworking Machinery.—The Oliver Machinery Company, Grand Rapids, Mich. Catalogue No. 16. Size 6 x 9 in.; pages 448. Deals with a line of woodworking machinery and factory supplies for navy yards, colleges, technical and trade schools, pattern shops, cabinet works, planing mills, builders, carpenters, contractors and all others who use power tools for reducing wood. In illustrating the different machines, for the most part a full page is given to the half-tone or line cut and brief specifications are given on the facing page. There are a number of views of different parts of the factory as well as installations of the company's machinery, and a comprehensive six-page index completes the catalogue.

Automatic Nut Tappers.—Robert J. Rodd, Cuyahoga Falls, Ohio. Pamphlet. Illustrations and descriptive matter explain the operation of a line of machines for automatically tapping hot or cold pressed nuts. These are built in six sizes, handle work ranging from 3-32 to $\frac{3}{8}$ in., and are either belt or gear driven.

Internal Combustion Engines.—The Foos Gas Engine Company, Springfield, Ohio. Catalogue No. 23. Describes a single-cylinder horizontal engine which is built in sizes of from 3 to 90 hp. These engines are built in stationary and portable types, the latter being mounted on skids or a steel truck. The special features of the engines are touched upon, and the engravings not only show the different styles of stationary engine but also a number of applications of the portable one.

Air Compressors, Gold Milling Machinery and Water Tube Boilers.—The Risdon Iron & Locomotive Works, San Francisco, Cal. Three catalogues. No. 7 calls attention to an extensive line of air compressing machinery and pneumatic mining drills. All of these are illustrated by half-tones and line engravings, and tables of specifications are included. No. 12 illustrates and describes a complete outfit of gold milling machinery, and No. 19 treats of the Risdon water tube boiler, which is built in sizes ranging from 60 to 600 hp. The various parts of these boilers are illustrated, and their special features are described at length.

Metal Culverts.—The Canton Culvert Company, Canton, Ohio. Pamphlet. Treats of the Acme metal culverts made from No-Co-Ro metal, which is said to be absolutely non-corrodible, and guaranteed to give satisfactory service for at least 25 years, when properly installed. The various factors producing corrosion in iron and steel are discussed, and comparative chemical analyses and the results of 12-hour corrosion tests of steel, charcoal iron and this metal are given.

Wheelbarrows and Trucks.—J. W. Paxson Company, Philadelphia, Pa. Bulletin No. 21. Pertains to the line of iron, steel and wooden wheelbarrows and bag, barrel and platform trucks which this company manufactures for foundries and industrial establishments.

Pipe Fittings.—McNab & Harlin Mfg. Company, 56 John street, New York City. Two circulars. One describes the Jenkins disk valves which this company makes, and the other shows some of the cast iron drainage fittings manufactured by it.

Gear Hobbers.—The Adams Company, Dubuque, Iowa. Circular No. 805. Describes and illustrates the Farwell gear hobber and covers both sizes of machine built. The various special features of the hobbers are pointed out, and a brief table of specifications completes the circular. Illustrated descriptions of the two sizes of machine appeared in *The Iron Age* June 4, 1908, and September 8, 1910, respectively.

Lap Welded Pipe.—American Spiral Works, P. O. Box 485, Chicago, Ill. Circular. Calls attention to the line of lap welded steel pipe made in sizes ranging from 12 to 72 in. in diameter, which was illustrated in *The Iron Age* February 2, 1911. This pipe is made from low carbon open hearth steel

and is especially suited for gas, compressed air, vacuum and high pressure hydraulic lines. The illustrations show some 30-in. lap welded pipe and fittings and an 11-ft. lap welded steel drum.

Air Brush.—F. J. Lederer Company, 400 Guilford street, Buffalo, N. Y. Pamphlet. Describes and illustrates the Buffalo air brush, which is a small automatic hand device, superseding the hair paint brush and all other devices for spraying or atomizing of paint. Some of its special uses are the application of paints, varnishes, japans, lacquers, enamels, liquid bronzes, glass enamels, asphaltums, shellacs, &c., to wood and metal, and it is stated that one man with this device can accomplish as much as four or five using the hair brush.

Refillable Cartridge Fuse Shells.—A. F. Daum Company, Pittsburgh, Pa. Pamphlet. Concerned with the Daum refillable cartridge fuse shell. Traces the development of the electric fuse from its earliest form, which was a simple piece of fusible wire to the cartridge type so extensively used at the present time. The various parts of this device, which are the shell, the caps fitting upon the ends and the special washers supporting the head of the fuse, are shown, as well as the different types of contacts which can be supplied.

Light and Power Transformers.—Triumph Electric Company, Cincinnati, Ohio. Bulletin No. 451. Contains a complete description with illustrations of the Triumph type L transformers, which are designed for use on overhead single phase circuits of all standard voltages and frequencies. One of the special features of these transformers is excellent regulation. *The Iron Age*, February 2, 1911, contained an illustrated description of these transformers.

Roller Jaw Chucks.—Weaver Mfg. Company, Springfield, Ill. Folder. Illustrates the Weaver roller jaw chuck for driving straight shank drills and reamers without slipping. As the name of the chuck indicates, the gripping is accomplished by three hardened tool steel rolls which hold the tool shank by friction. An illustrated description of this chuck appeared in *The Iron Age*, January 19, 1911.

Boring, Drilling and Milling Machines and Power Millers.—Franklin Machinery Company, Franklin, Pa. Booklet. Describes a line of horizontal and universal boring, drilling and milling machines and power milling machines. The construction of these machines is especially rigid and they are able to handle a wide range of work. The different machines and their special parts are illustrated and brief tables of specifications occupy the facing pages.

Upright Power Hammers.—E. R. Caldwell & Co., 34 Hilton street, Bradford, Pa. Circular No. 46. Shows the Scranton upright power hammer, the special features of which are the absence of any horizontal movement, the use of few parts and the avoidance of wear and jar. The construction of the hammer is described at length and a partial list of users completes the circular.

Lathe Mandrels and Steam Traps.—W. H. Nicholson & Co., Wilkes-Barre, Pa. Two pamphlets. The first refers to the use of expanding mandrels as a substitute for measuring pieces turned out in the lathe by caliper. These mandrels are made in sets of nine and will fit any size of hole from 1 to 7 in. in diameter. The special advantage claimed for their use is a saving of time. The various sizes of mandrels are shown and there are a number of illustrations showing them in use. The other pamphlet points out the advantages of using the Wyoming automatic eliminator to secure dry steam. This device is made in a number of sizes ranging from 3 to 16 in., for use in steam lines from 25 to 3000 ft. long supplying steam for all purposes. Two types of eliminator, a vertical and a horizontal one, are made. Both of these are illustrated and sectional drawings show their construction. Tables of dimensions of the two types and a partial list of users complete the pamphlet.

Generators and Conduits.—Sprague Electric Company, 627 West Thirty-fourth street, New York City. Bulletin and catalogue. The first, No. 111, contains a partial list of installations of engine generators and also shows some of them. The catalogue, which is No. 436, is of the standard 6 x 9 in. size. It contains illustrations, descriptions and prices of the various types of conduits made by this company, as well as the boxes, fittings and tools.

Electric Fans.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Circular and two folders. The first, No. 1165, shows the company's standard line of electric fan motors for the 1911 season. These motors are designed to operate on regular lighting circuits at the ordinary frequencies and voltages. Folder No. 4101 is devoted to direct current fan motors and No. 4108 concerned with motor exhaust fans.

Monel Metal.—The Bayonne Casting Company, East Tenth street, Bayonne, N. J. Brochure. Concerned with the various forms in which this metal is sold and its different uses. The special advantages of it are that it has a high tensile strength, is noncorrosive, machines readily and can be forged, soldered, brazed or electrically welded. Reports on tests of different shapes of this metal are included, and there are a number of useful tables of information. An illustrated description of some special castings made in this metal appeared in *The Iron Age* January 20, 1910.

Ventilators.—Bicalky Fan Company, 866 Prospect avenue, Buffalo, N. Y. Booklet. Shows some installations of the Bicalky roof fan ventilator, in which a rotating fan wheel creates a vacuum and causes an upward circulation of air at all times. The power and the suction portions of the wheel are entirely separate, so that the air current driving the wheel and the other exhausting the foul air from the building do not interfere with each other.

Autogenous Welding and Cutting.—The Waterhouse Company, Pelham street, Boston, Mass. Pamphlet. Points out the adaptability of the oxy-acetylene process for welding and cutting metals. The pamphlet is almost entirely made up of illustrations showing the great variety of work which it is possible to handle in this way.

Castings.—The Hartford Foundry Corporation, Windsor and Suffield streets, Hartford, Conn. Pamphlet. Calls attention to a number of gray iron castings which this firm has made, ranging from small automobile parts weighing, in some cases, about 1 oz., up to 12 and 15 ton castings for engine beds and steam turbines.

Castings for Municipal Work.—The Murray Iron Works Company, Burlington, Iowa. Pamphlet. Devoted to a line of castings for sewer, water and street lighting work. All of these castings are illustrated and two of them, a catch basin and a sewer outlet, both of which are patented, are described at length.

Tool Steels.—Edgar T. Ward & Sons, 25 Purchase street, Boston, Mass. Catalogue H. Size 5 x 7½ in.; pages 128. Treats of the various kinds and shapes of tool steel which this firm handles. These include cold rolled bars, strips and sheets; fine finished wire and rods, Capital and Dannemora tool steels, seamless steel tubing, twist drills, gear and milling cutters, taps, reamers and hack saws. Hints on the working of tool steel are given, with a table giving information on the treatment of ordinary tool steels. The labels of the various brands are reproduced and lists are given of the various sizes in which the different shapes can be furnished.

Basket Handling Machinery.—Taylor Machine Company, Penn Yan, N. Y. Folder. Calls attention to a machine for nailing the handles on fruit baskets. In operation the tacks and the nails used are placed in a hopper and the four holding the handle in place are driven simultaneously by foot power.

Expansion Bolts.—Diamond Expansion Bolt Company, 90 West street, New York City. Pamphlet. Relates to the different types of Diamond bolts. The various sizes in which these bolts can be supplied are listed, together with the price per hundred. Among the bolts described are the Diamond expansion and the Diamond boiler repair bolts, which were illustrated in *The Iron Age* November 17, 1910, and February 9, 1911, respectively.

Feed Mills and Wood Saws.—Victor Feed Mill Company, Springfield, Ohio. Catalogue No. 16. Treats of the Victor feed mills for grinding all kinds of grain and fodder, and a steel frame wood saw for poles, slabs and cordwood.

Friction Clutches.—The Moore & White Company, Philadelphia, Pa. Catalogue. Size 6 x 9 in.; pages 83. This is the company's 1911 catalogue illustrating and describing its patent friction clutches and speed changes. The description is brief, but comprehensive, and tables giving the speeds, horsepower, weight and dimensions of the various sizes are included.

Gear Cutters and Shapers.—Gould & Eberhardt, Newark, N. J. Two pamphlets. The first, entitled "Practical Hints," is intended to be used as a ready reference in connection with the correct operation of the patented automatic gear cutting machines and the cutter grinders of this firm. Directions are given for operating the machines, and this is followed by hints on spur gear cutting. Illustrations showing the comparative sizes of involute gear teeth, and tables of tooth parts and correction factors for the addendum and the thickness of the teeth, are included. The other pamphlet pertains to the line of High Duty shapers and attachments, and shows a number of the different styles and sizes of tools. In this pamphlet a general description of the line of shapers and their special features is first given, and this is followed by illustrations and brief specifications of the various sizes.

Recording Thermometers.—The Bristol Company, Waterbury, Conn. Bulletin No. 127. Describes with numerous illustrations the Bristol class III. recording thermometers for temperatures between 60 degrees below zero and 800 degrees F. Among the instruments covered is the compensating gas filled recording thermometer, which was illustrated in *The Iron Age* January 19, 1911. Various kinds of charts used with these instruments are reproduced, and a partial list of users and uses completes the bulletin.

Molding Machine.—The Tabor Mfg. Company, Eighteenth and Hamilton streets, Philadelphia, Pa. Bulletin M-R. Covers the line of power squeezing molding machines made by this company, and describes their construction with considerable detail. The operation of the machines is gone into at length, and there are a number of illustrations showing patterns cast from match plates made from various metals.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from store—

Genuine Iron Sheets— Galvanized.

METALS— Tin—

Refined Iron:	
1 to 1 1/2 in. round and square.....	\$ 1.75c
1 1/2 to 4 in. x 3/4 to 1 in.....	\$ 1.85c
1 1/2 to 4 in. x 5/4 to 5-1.....	\$ 1.85c
Rods—3/8 and 11-16 round and square.....	\$ 1.85c

Angles:	
3 in. x 1/2 in. and larger.....	\$ 2.00c
3 in. x 3/16 in. and 1/2 in.....	\$ 2.10c
1 1/2 to 2 1/2 in. x 1/2 in.....	\$ 2.10c
1 1/2 to 2 1/2 in. x 3/16 in. and thicker.....	\$ 2.00c
1 to 1 1/2 in. x 3/16 in.....	\$ 2.10c
1 to 1 1/2 x 1/4 in.....	\$ 2.30c
3/4 x 1/4 in.....	\$ 2.30c
3/4 x 1/4 in.....	\$ 2.40c
3/4 x 1/4 in.....	\$ 4.35c
3/4 x 1/4 in.....	\$ 4.35c
3/4 x 3-32 in.....	\$ 4.35c

Tees:	
1 in.....	\$ 2.65c
1 1/4 in.....	\$ 2.45c
1 1/2 to 2 1/2 x 1/4 in.....	\$ 2.15c
1 1/2 to 2 1/2 x 3/16 in.....	\$ 2.35c
3 in. and larger.....	\$ 2.05c

Beams.....	\$ 2.00c
Channels, 3 in. and larger.....	\$ 3.00c
Hands—1 1/2 to 6 x 3-16 to No. 8.....	\$ 2.30c
"Burdett's Best" Iron, base price.....	\$ 3.15c
"Burdett's" "H. B. & S." Iron, base price.....	\$ 2.85c
Norway Bars.....	\$ 3.60c

Merchant Steel from Store—

Bessemer Machinery.....	\$ 1.90c
Toe Calk, Tire and Sleigh Shoe.....	\$ 2.50c
Best Cast Steel, base price in small lots.....	\$.7c

Sheets from Store— Black

One Pass, C.R.	R. G.
Soft Steel.	Cleaned.
No. 16.....	\$ 2.55c
Nos. 18 to 20.....	\$ 2.90c
No. 22 and 24.....	\$ 2.75c
No. 26.....	\$ 3.00c
No. 28.....	\$ 3.10c
No. 28.....	\$ 2.95c
No. 28.....	\$ 3.30c

Russia, Planished, &c.

Genuine Russia, according to assortment.....	\$ 12 @ 14c
Patent Planished, W. Dewees Wood.....	\$ A, 10c; B, 9c net.

Galvanized.

Nos. 12 and 14.....	\$ 2.95c
Nos. 22 to 24.....	\$ 3.30c
No. 26.....	\$ 3.50c
No. 28.....	\$ 3.80c
No. 29 and lighter 36 inches wide, 25c higher	

Nos. 22 and 24.....	\$ 5.15c
No. 26.....	\$ 5.25c
No. 28.....	\$ 5.15c

Corrugated Roofing—

2 1/2 in. corrugated.....	Painted	Galvd
No. 24.....	\$ 100 sq. ft. \$5.85	4.50
No. 26.....	\$ 100 sq. ft. 2.95	4.00
No. 28.....	\$ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20.....	\$6.65
IX, 14 x 20.....	5.90
A. Charcoal:	
IC, 14 x 20.....	\$5.60
IX, 14 x 20.....	5.70

American Coke Plates—Bessemer—

IC, 14 x 20.....	\$4.50
IX, 14 x 20.....	3.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating.....	\$8.70
IX, 20 x 28 with an 8 lb. coating.....	10.70

Seamless Brass Tubes—

List November 12, 1908.....	Base price 18c
List November 13, 1908.....	Base price 18c

Copper Tubes—

List November 13, 1908.....	Base price 21c
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Braze Brass Tubes—

List August 1, 1908.....	19 1/2c \$ D
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High Brass Rods—

List August 1, 1908.....	14 1/2c \$ D
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Roll and Sheet Brass—

List August 1, 1908.....	14 1/2c \$ D
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Brass Wire—

List August 1, 1908.....	14 1/2c \$ D
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Copper Wire—

Base Price.....	Carload lots mill 13 1/2c
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Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots).....	\$ 16 c
Sheet Copper Cold Rolled, 1c.....	16c advance over Hot Rolled
Sheet Copper Polished 20 in. wide and under, 1c.....	
square foot	
Sheet Copper Polished over 20 in. wide, 2c.....	square foot
Polished Copper, 1c.....	square foot more than Polished.

Straits Pig.....	\$ 46.00
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Copper—

Lake Ingot.....	\$ 14.00
Electrolytic.....	\$ 14.00
Casting.....	\$ 14.00

Spelter—

Western.....	\$ 6.00
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Zinc.

No. 3, base, casks.....	\$ 8 @ 10c
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Lead.

American Pig.....	\$ 11.00
Bar.....	\$ 11.00

Solder.

1/2 & 3/4, guaranteed.....	\$ 25 @ 28c
No. 1.....	\$ 25 @ 28c
Refined.....	\$ 25 @ 28c
Prices of Solder indicated by private brand vary according to composition.	

Antimony—

Cookson.....	\$ 10.00
Balletts.....	\$ 10.00
Other Brands.....	\$ 10.00

Bismuth—

Per. lb.....	\$1.00 @ 12.50
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Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting.....	\$ 25 @ 28c
Rods & Wire.....	\$ 25 @ 28c
Sheets.....	Base Price 31c

Old Metals.

Dealers' Purchasing Prices Paid in New York

Copper, Heavy cut and crucible.....	\$ 10.75 @ 11.10
Copper, Heavy and Wire.....	\$ 10.00 @ 10.10
Copper, Light and Bottoms.....	\$ 9.50 @ 9.75
Brass, Heavy.....	\$ 7.00 @ 7.10
Brass, Light.....	\$ 6.50 @ 6.75
Heavy Machine Composition.....	\$ 3.50 @ 3.75
Clean Brass Turnings.....	\$ 7.00 @ 7.25
Composition Turnings.....	\$ 3.50 @ 3.75
Lead, Heavy.....	\$ 1.00 @ 1.10
Lead, Tea.....	\$ 1.00 @ 1.10
Zinc Scrap.....	\$ 1.00 @ 1.10



11.00
10.75
9.75
7.25
4.75
2.00
2.25
4.50
1.75
3.50
4.00